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THE DISTRIBUTION OF EDDY VELOCITIES AND TEMPERATURE FLUCTUATIONS IN THE FIRST 100 METERS

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UNITED STATES ARMY ELECTRONICS COMMAND
ATMOSPHERIC SCIENCES LABORATORY, RESEARCH DIVISION
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ABSTRACT

Practical problems dealing with atmospheric turbulence can be simplified by relating fluctuation values to a Gaussian distribution. This is very useful, since it specifies characteristics of the eddy velocity distributions. Fragmentary studies have given some evidence to support the Gaussian hypothesis, but to our knowledge this is the first attempt to examine the distributions of the fluctuation components for a large data sample (135 one-hour runs).

The purpose of the study is to determine the deviations of the observed distribution from a normal distribution and to attempt to determine if these departures can be related to atmospheric stability, surface roughness, and height above the surface. In addition, each sample was tested to determine the probability of its coming from a normal distribution. Results are in general agreement with previous investigations. Low frequency trends over hour periods tend to increase the departures from a normal distribution. Treating the probability distributions of the wind components as being normally distributed appears justified over moderate ranges of stability (z/L between -.300 and +.300).

C O N T E N T S

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I. INTRODUCTION

Practical problems dealing with atmospheric turbulence can be simplified by relating fluctuation values to a Gaussian distribution. This technique has proved useful for specifying the characteristics of the eddy velocity distributions.

Previously published studies have given some evidence that the fluctuations of turbulent components show a Gaussian distribution, but to our knowledge this is the first attempt to examine the distribution of the turbulent components for a large sample. In this study, we have examined 135 runs (approximately 160 hours of data). The observed frequency distributions of the turbulent components of wind and temperature for each run were tested against the normal curve with the observed standard deviation. Since only a small percent of the distributions met the criteria for normal distribution under the chi-square test, the skewness and kurtosis of the distributions were examined. The data were examined by the direction from which the air comes, and stability. Though there is considerable scatter in this data there are strong indications that the distribution of the horizontal components of the wind are affected by upwind discontinuities in the surface and surface roughness elements. The standard deviations and the skewness of the distributions are examined for three typical cases with different fetches. These results are in reasonable agreement with present internal boundary layer theories and qualitatively appear to conform reasonably well with wind tunnel observations.

II. EXPERIMENTAL METHOD

a. Site Description

The data were collected at the Round Hill Field Station, South Dartmouth, Massachusetts, by Cramer, Record, and Tillman of the Massachusetts Institute of Technology* Figure 1 shows the site layout and the location of the two towers that were used. Tower 1 (T1) is a 40-meter tower near the beach, and Tower 2 (T2) is a 91-meter tower in the woods. The towers are approximately 900 meters apart. The site has ocean bordering the south and east, a tidal marsh between the towers, and a ridge to the west that is

*Present Affiliations: Cramer and Record, GCA Corp; Tillman, UCLA.

oriented north-south and reaches a height of 27 meters. Data were taken when the wind direction was from SSW to NNE, where the effects of cultural and physiographic features combine to produce a complex flow structure.

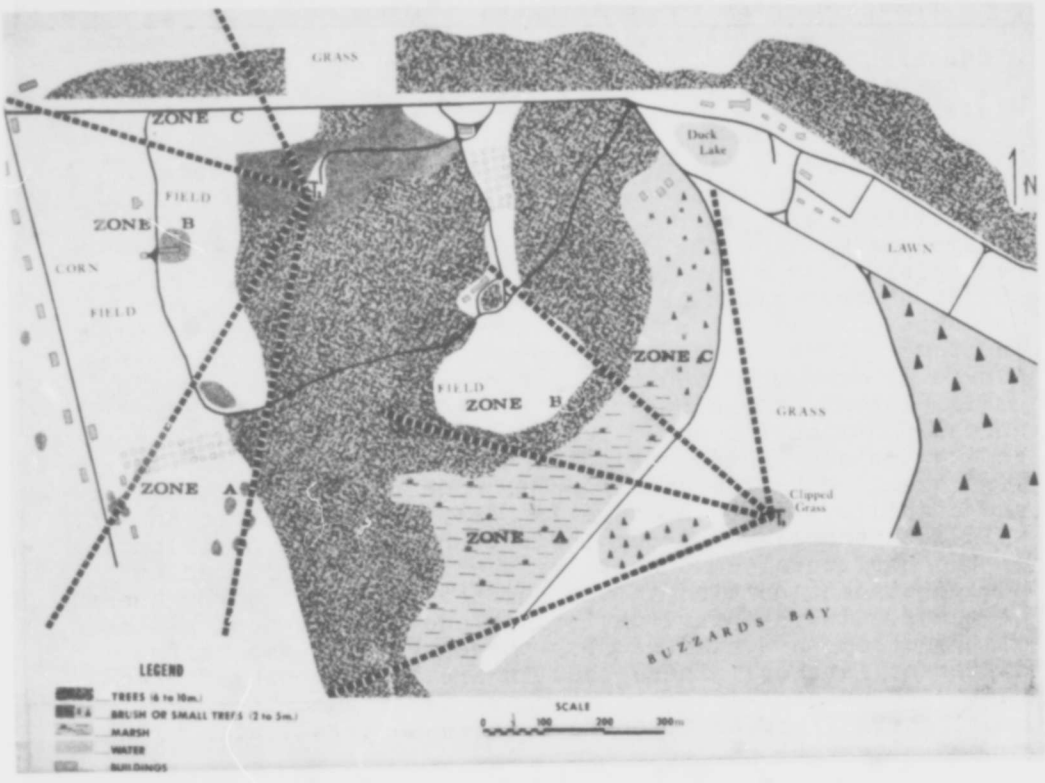

FIGURE 1. MIT ROUND HILL FIELD SITE

Measurements for the wind components were taken with thermistor-anemometers and lightweight mechanical bivanes. Temperature measurements were made with platinum-wire resistance thermometers. Sensor outputs were filtered electronically to eliminate spectral-foldover in the sampled data and to provide the same frequency response for all transducers. Details of the instrumentation and data recording systems used are discussed by Cramer, Record, Tillman and Vaughn (1961). The first seven runs were measured at 1-second intervals, and the remainder at 1.2-second

intervals. At Tower 1 (Figure 1) data were taken at the 16- and 40-meter levels. At Tower 2 (Figure 1) data were taken at the 15-, 46-, and 91-meter levels. Only two levels were taken simultaneously on one tower, so data are not available at both towers or all three heights at the same time.

b. Treatment of the Experimental Data

The mean vector wind and temperature for a period of approximately one hour were computed from the raw wind speed, azimuth angle, elevation angle, and temperature analogs. The mean vector value was used to establish the coordinate system with the u-component lying in the direction of the mean vector wind and the remaining components defined orthogonal to this direction, the w-component upward and the v-component to the left of u. For each component, u, v, and w, and the temperature T, a running mean* was computed and then subtracted from the component observation corresponding with the central time of the running mean. The resulting difference is defined as the turbulent fluctuation of that component or temperature. The process of subtracting the running mean acts as a high pass filter which eliminates low frequency oscillations.

The frequency distributions were determined by dividing the ranges into class intervals, usually 17, commensurate with the observed maximum and minimum values as outlined in Hoel (1954). Histograms were prepared for each component and temperature of each run. The standard deviation, skewness and kurtosis were computed. For comparison, a corresponding Gaussian probability distribution was computed from the standard deviation using

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} \exp\left[-\frac{1}{2}\frac{(x')^2}{\sigma}\right]$$

where x' indicates the class marks or class boundaries and σ denotes the standard deviation. The ordinate of the observed probability distribution function at each class mark was estimated from the product of the observed frequency of the class interval and the corresponding ordinate of the Gaussian probability curve within the class interval. The areas were determined by integrating under the curve.

* A 601-point running mean was used on data for both towers. Also a 101-point running mean was used on T1 and a 61-point running mean on T2.

A stability measure, the Monin-Obukhov (1954) z/L was calculated as:

$$z/L = -\frac{g}{T}\frac{\overline{w'T'}\,kz}{(\overline{u'w'}^2 + \overline{v'w'}^2)^{3/4}}$$

where $\overline{w'T'}$, $\overline{u'w'}$ and $\overline{v'w'}$ are covariances, g is the gravity constant, T is the absolute temperature, and k is the Von Karman constant.

III. DISTRIBUTION OF WIND COMPONENTS AND TEMPERATURES

a. The Chi-Square Test

The chi-square test was used to test the data for goodness of fit between the observed probability distribution and the Gaussian distribution. Chi-square is defined as:

$$\chi^2 = \sum_{i=1}^{\kappa}\frac{(o_i - e_i)^2}{e_i}$$

where o_i and e_i denote the ith pair of observed and expected frequencies, respectively.

b. Results

The results of the chi-square test for the distribution of the wind components and the temperature are shown in Figure 2. The ordinate is the percentage of runs which meet the .01 probability criterion for a normal distribution. At the Round Hill Site these distributions can rarely be considered normally distributed. With increasing height above the surface, there is less tendency for the distributions to be Gaussian. A 12.02 minute (601-point) running mean filter was applied to reduce the effects of the long period oscillations and the trend. In every case, use of a filter increased the number of runs which met the criterion. Changes after a 2.02-minute (101-point) running mean on Tower 1 and a 1.22-minute (61-point) running mean on Tower 2 were small except on Tower 1 where the percent of cases meeting the criteria increased for u', v' and T' at the 16-meter level and for u' at the 40-meter level.

c. Discussion

The results appear to contradict those of previous investigators and seem to invalidate the useful practice of treating the eddy fluctuations as being Gaussian.

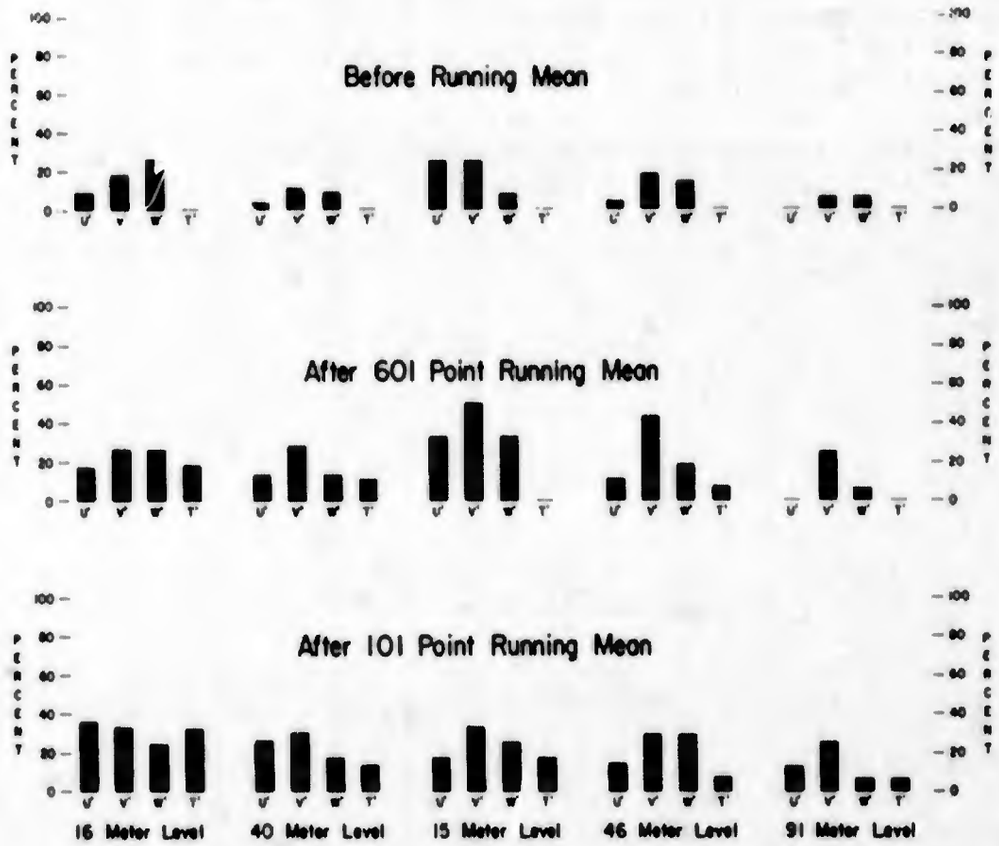

FIGURE 2. PERCENT CASES MEETING CHI-SQUARE PROBABILITY OF 0.01

However, this conclusion is not warranted without considering the user's needs and the site characteristics. Examination of Figure 1 shows that the only direction that is reasonably homogeneous is from the north at Tower 1. Other directions have marked inhomogeneity in surface characteristics. Changes in the wind directions during each run are frequently great enough to involve a mixture of surface conditions.

The effects of a horizontal discontinuity in surface roughness upwind from the measuring site have been estimated in the work of previous investigators. Elliott (1958), Panofsky and Townsend (1964), Miyake (1965), and Townsend (1965) have discussed in detail the effects of surface discontinuities on wind profiles and the build-up of internal boundary layers. A wind tunnel study by Plate and Lin (1965) of the velocity field downstream from a two dimensional obstruction can also be used to anticipate certain features of distribution.

Prevailing internal boundary layer hypotheses are based on the assumption that when a change in surface is encountered, the flow very near the surface adapts quickly

to the new surface. These new flow characteristics are propagated upward by the turbulence. The factors which control the rate of build-up downstream are believed to be the relative magnitude of the roughness change and the stability. Miyake (1965) treated the problem as diffusion from a line source; in his model the rate of build-up is related to the standard deviation of w' downstream from the roughness discontinuity. All of the above investigators assume that the flow above the internal boundary layer retains the characteristics of the previous surface.

Using these concepts, Appleby and Pries (1966) were able to show a relationship between the standard deviations of the horizontal wind components, local wind speed, and stability when the upstream roughness regimes were segregated.

IV. DEPARTURES OF THE FLUCTUATION VALUES FROM A GAUSSIAN DISTRIBUTION

In this section we will present the measured skewness and kurtosis of the frequency distributions of the wind components and temperature, and examine the vertical structure in as much detail as the observations permit for individual runs over several fetches. The results will be compared to those one might expect from the internal boundary layer hypotheses to see if these can be used to explain the observations.

a. Internal Boundary Layers

Before discussing the Round Hill observations it might be useful to examine wind tunnel observations, where more detail is available. The wind tunnel observations from the U.S. Army wind tunnel at Colorado State University appear to qualitatively show many of the features of internal boundary layers. Figure 3 shows the wind and stress profile at two locations downwind from a 20-foot section of 2-inch flexible plastic strips. Behind these plastic strips the test section was covered with 0.75 inch gravel, so the air traveled from a very rough surface to a less rough surface. The first profile is at a distance of 20 feet from the roughness discontinuity and the second is 37.5 feet from the discontinuity. These observations show that for the wind tunnel neither the assumptions of Elliott nor those of Panofsky or Townsend are entirely correct. Elliott assumes the stress is constant with height and is discontinuous at the boundary. Panofsky and Townsend allowed the stress to increase linearly with height from the ground to the internal boundary surface. Unfortunately, no observations were available below 4.75 inches at the second station, so no estimate of the boundary layer growth

could be made. However, the constant stress region generated by the plastic strips has begun to narrow downstream.

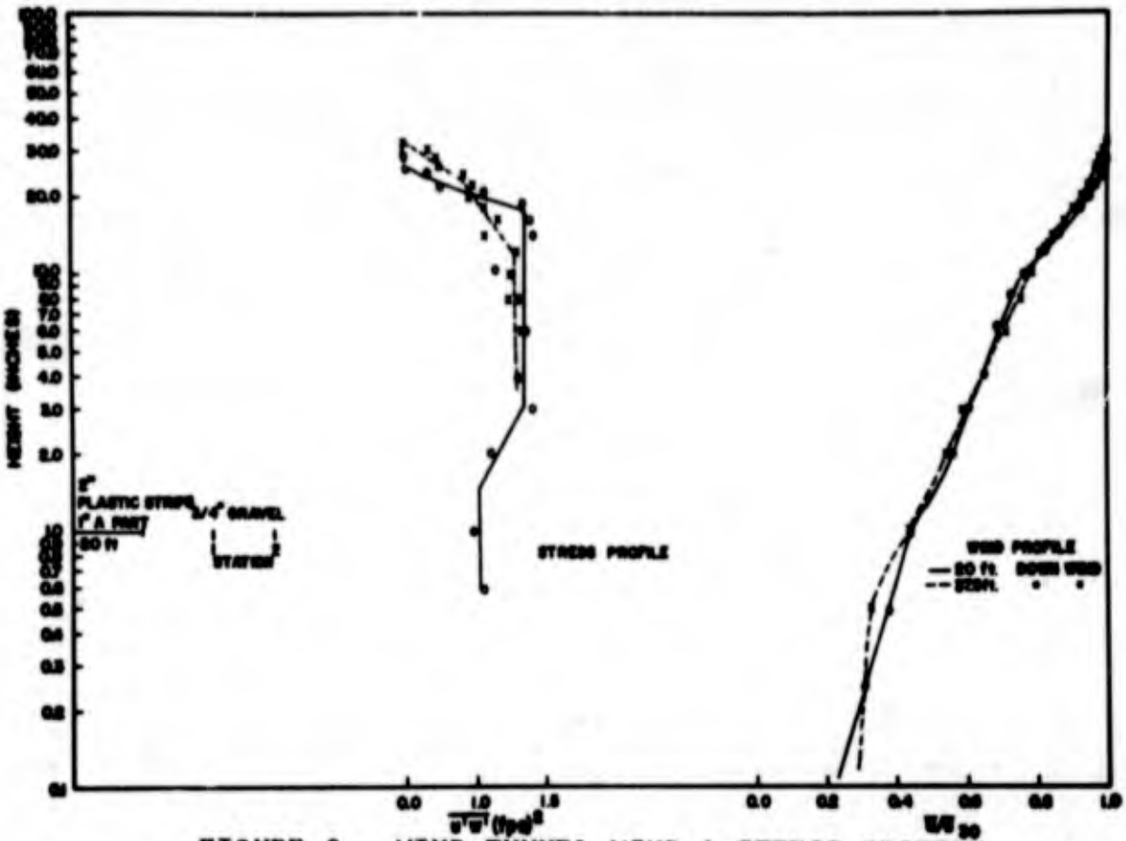

FIGURE 3. WIND TUNNEL WIND & STRESS PROFILE
AT 20 AND 37.5 FT DOWNWIND FROM A ROUGHNESS CHANGE

The interface of the internal boundary layer appears as a zone of increasing stress and the marked change in the wind profile occurs at the lower edge of the zone, while at the upper edge of the zone the change is barely discernible. Figure 4 is from a study by Plate and Lin (1965). This figure shows their interpretation of the flow behind a simulated hill in the wind tunnel. Although conditions are exaggerated, the results are in general agreement with the observation downwind from the change in roughness. Figure 5 shows the wind (closed circles) and u' variance (open circles) downwind from a hill. The $\overline{u}'^2$ profile appears consistent with their interpretation of the flow zones, and shows the variance to be propagated both upward and downward from the peak generated by the hill. These observations were made under a neutral thermal stratification. Observations made with the tunnel floor heated did not include stress or variance measurements, but some idea of the effects of instability can be obtained from the wind profiles.

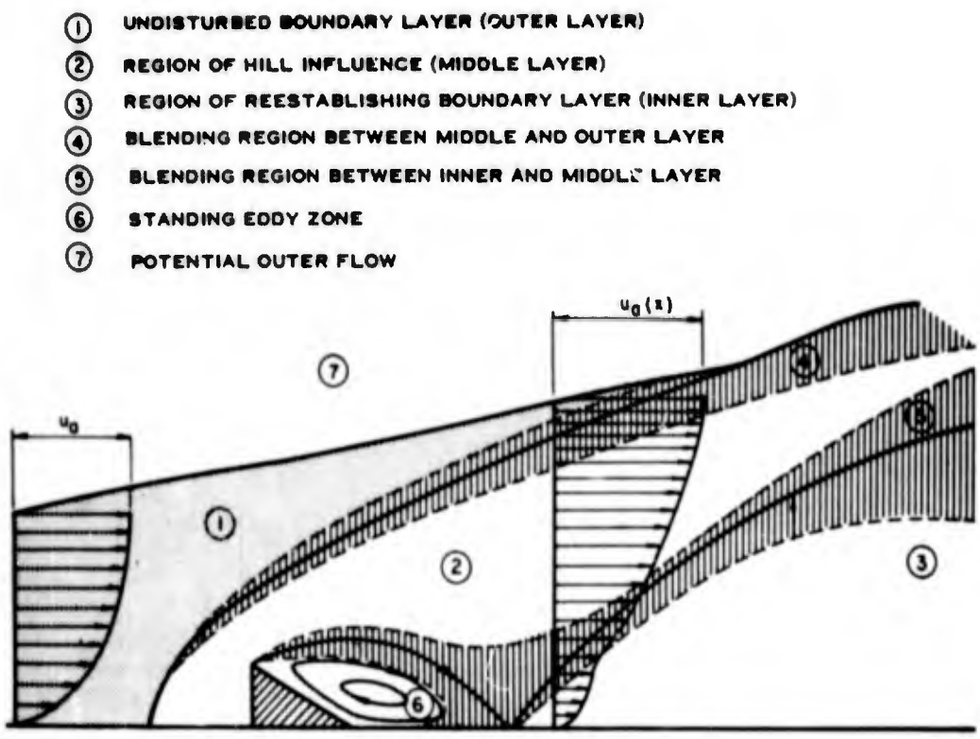

FIGURE 4. DEFINITION OF FLOW ZONES (PLATE AND LIN)

Figure 6, also using data from the U.S. Army wind tunnel, shows a comparison of the distance required for the wind profile to reach readjustment for a neutral and an unstable case. The hatched area is the region where the wind velocity is less than 95 percent or more than 105 percent of the velocity at the level upstream from the hill. This figure illustrates that under unstable conditions the added thermal energy tends to destroy any discontinuities at a shorter distance downstream. It is felt that the turbulent energy is spread through a broad area much like the spread of u'^2 in Figure 5, except at a faster rate.

If we modify our present concepts of internal boundary layers with the qualitative information from the wind tunnel and use our present knowledge of turbulence, we can postulate certain features we might expect to find in the vertical structure of turbulence downwind from surface discontinuities. For example, in a situation where the flow is from a rough to a smooth surface with nearly the same surface heat flux, the stress profile would be similar to that in Figure 5. The standard deviations of the turbulent components should show similarly shaped profiles and there would be a transport of turbulence downwind in the region of increasing stress. During unstable conditions, the

addition of thermal energy would probably mask these features, as the effect of the discontinuity would be spread over a thick layer.

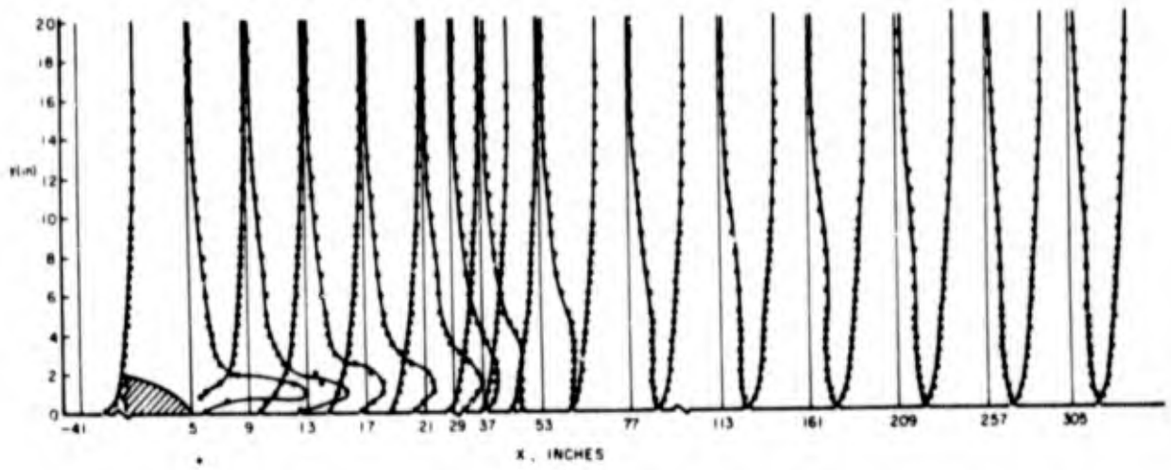

FIG. 5 VELOCITY DISTRIBUTION FOR 2"x 10" HILL, BIG WIND TUNNEL u_0 ~30 fps

(PLATE AND LIN)

As stability increases, the growth of the new internal boundary layer should be slower, since the turbulent intensity decreases, and the blending zone should be better defined. At extreme stability, the zone may not extend to great heights, since the turbulent intensities are very low and the flow tends to become disassociated from the surface (Panofsky, Blackadar and McVehil, 1960). Since the turbulence is also affected by wind speed and stability, the growth of the internal boundary, as well as the width of the zone between the two regions, would be affected by the wind speed and the thermal response of the upwind surfaces. In the region of the interface between internal boundary layers, measurements of the probability distribution show some skewness, since the vertical distribution of the standard deviations depends on the upwind roughness and thermal characteristics. If these features are observed in the atmosphere downwind from surface discontinuities, it will help confirm certain aspects of internal boundary layer theories and provide a means of estimating the vertical structure of turbulence over non-ideal sites.

Figures 7 and 8 were prepared to characterize the surface conditions for particular runs at Round Hill. These are panoramic views taken from the top of Tower 1, at approximately 40 meters above the ground, and from Tower 2 at approximately 25 meters above the ground. Below the

pictures are the directions of each run. Two standard deviations of the azimuth angle of the wind during the run are shown by the horizontal arrows.

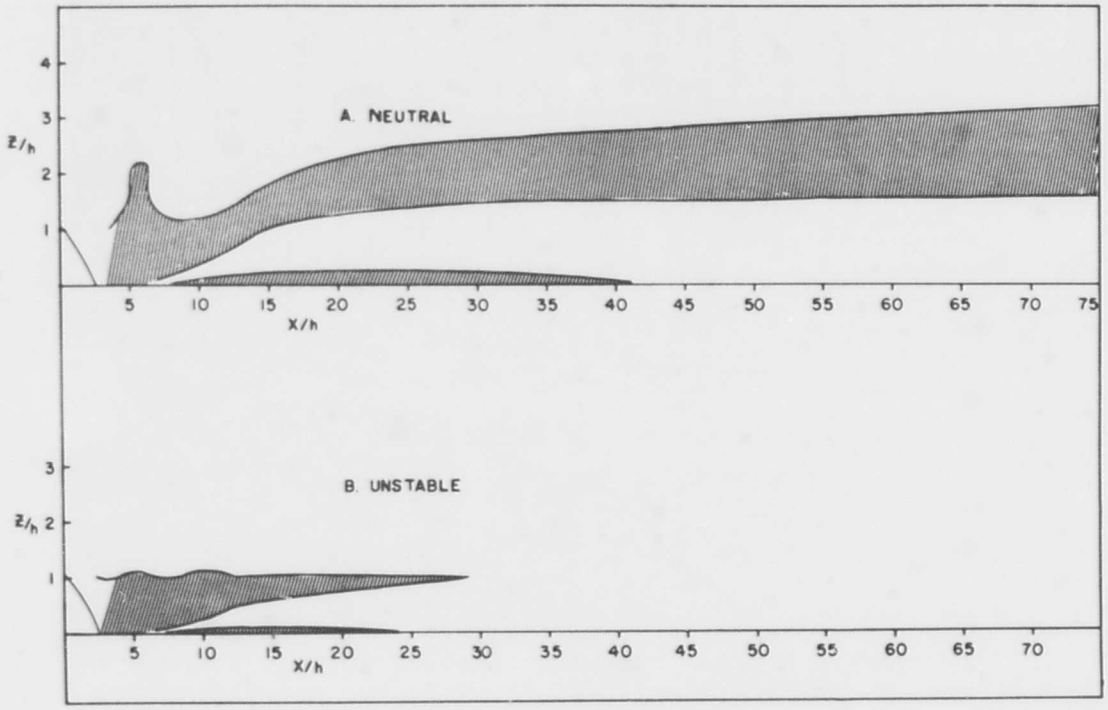

FIGURE 6. WIND TUNNEL WIND PROFILE READJUSTMENT

The data were stratified into zones that have different characteristics as shown on the pictures. Skewness and kurtosis of each run were then plotted against stability. Since the standard deviations of the azimuth angles vary from 5° to 20°, some runs overlap into other zones which increases the scatter in the data. Annex A contains tabulations of the basic data in the form of standard deviations of the wind components and temperatures, the skewness and kurtosis of their frequency distributions, and the stability parameter (z/L) for the available levels by run number.

b. Departures of Frequency Distributions from the Normal Curve

Computations of the skewness and kurtosis were made to measure the departure of the actual distributions from the normal.

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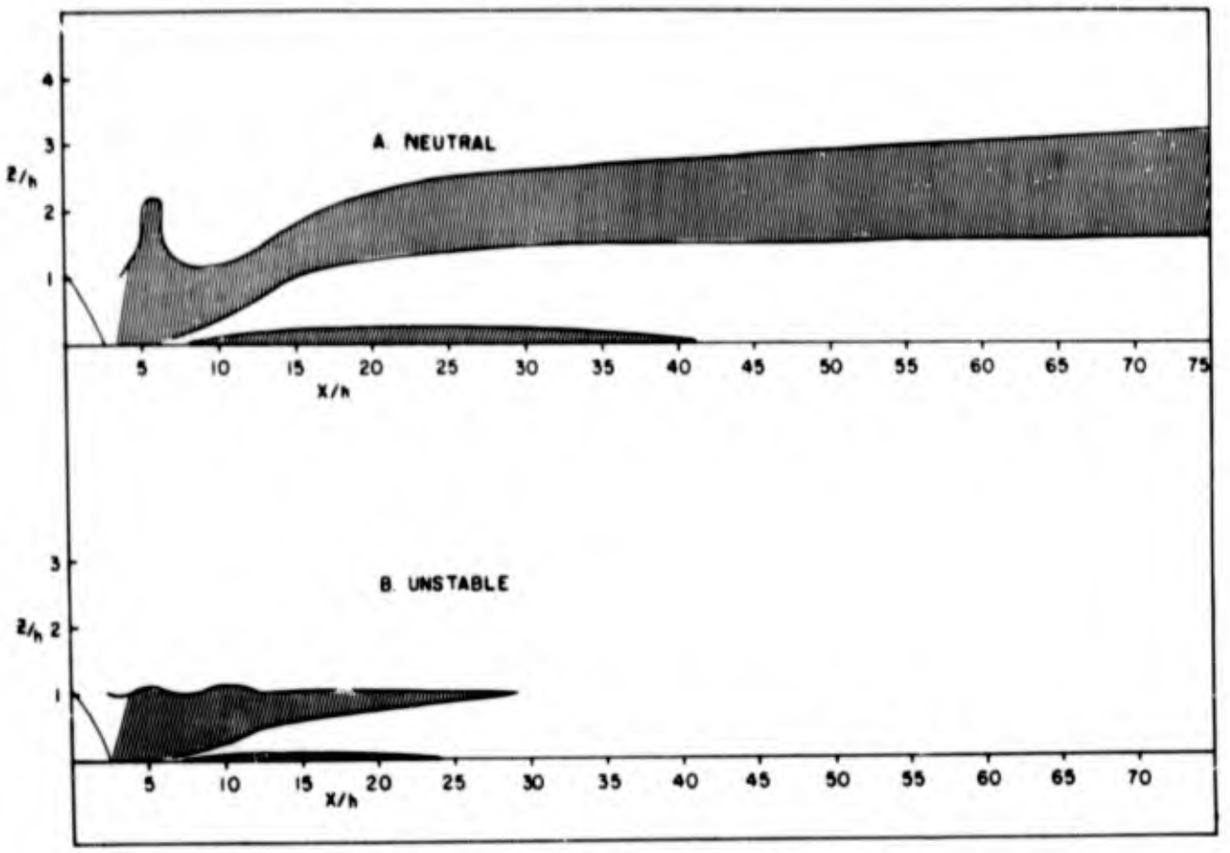

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b. Departures of Frequency Distributions from the Normal Curve

Computations of the skewness and kurtosis were made to measure the departure of the actual distributions from the normal.

The skewness, which shows the departure of a frequency distribution from symmetry, was computed using:

$$SK = \frac{\Sigma x'^3}{N\sigma^3}$$

where x'^3 is the third moment and σ is the standard deviation.

The kurtosis, which shows the distortion of a curve from the normal curve, was computed using:

$$KT = \frac{\Sigma x'^4}{N\sigma^4} - 3$$

where x'^4 is the fourth moment. The plots of skewness and kurtosis versus stability (z/L) are shown in Figures 9 to 20. The symbols are: triangle for Zone A, circle for Zone B, square for Zone C, + for winter cases, S for sea trajectories and T for transition of stability.

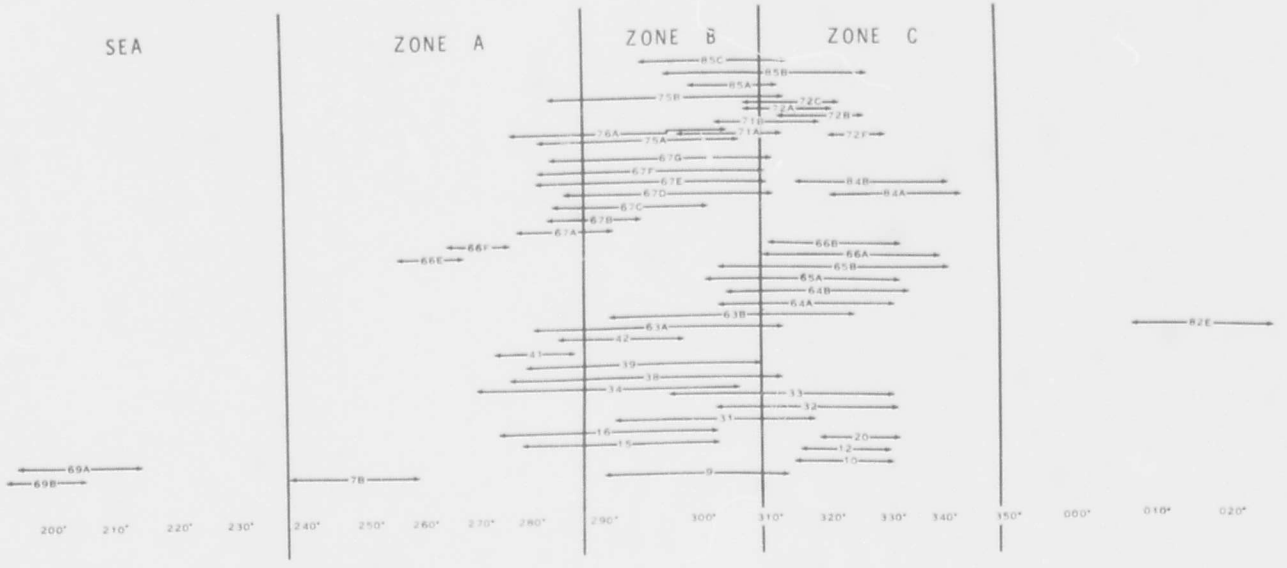

FIGURE 7. VIEW FROM 40-METER TOWER (T1).

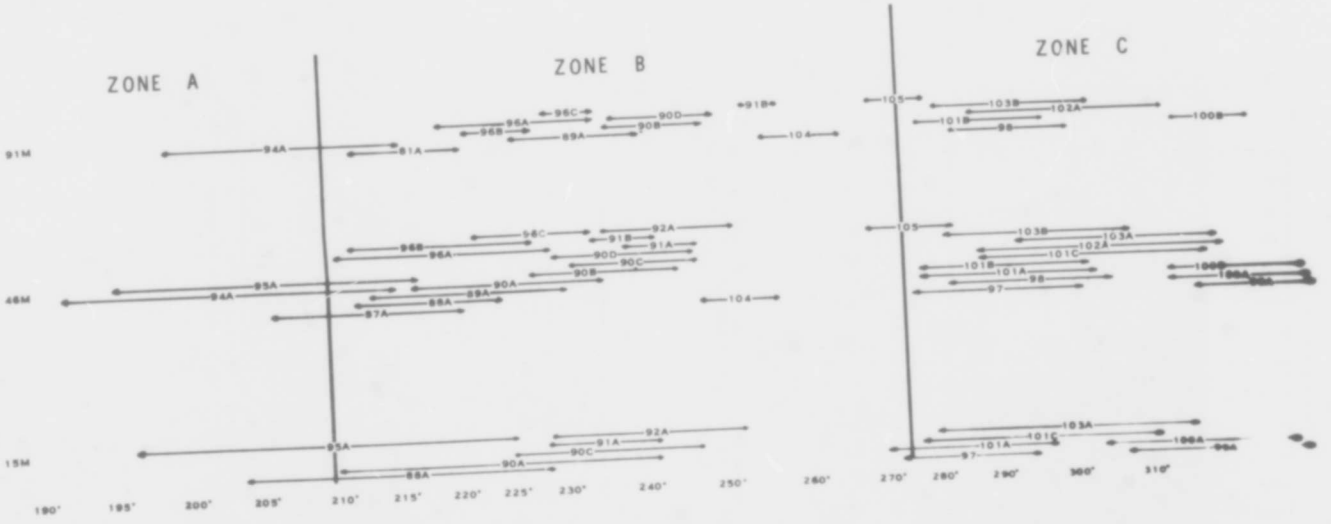

FIGURE 8. VIEW FROM 91-METER TOWER (T2).

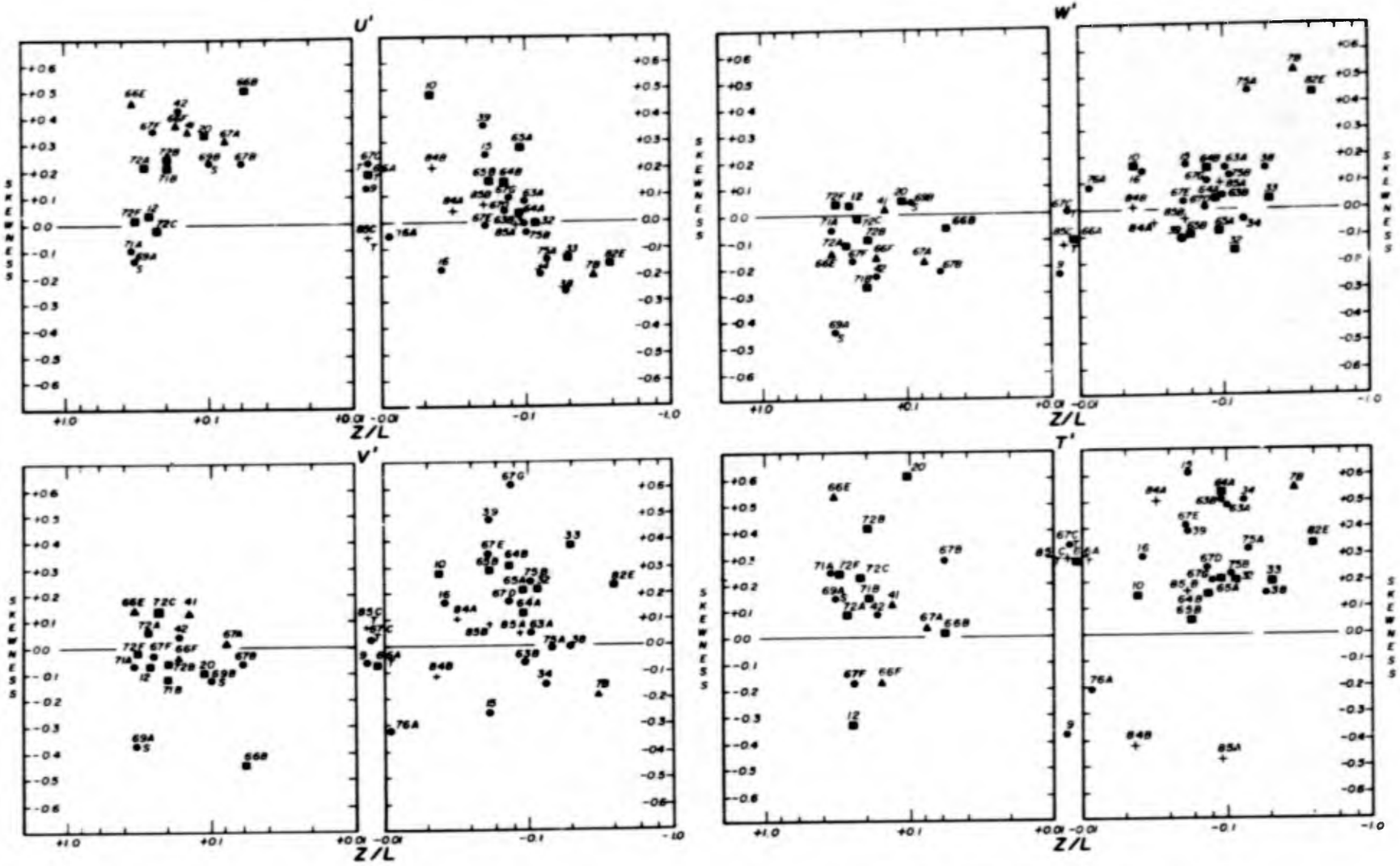

FIGURE 9. SKEWNESS OF FREQUENCY DISTRIBUTION AS FUNCTIONS OF STABILITY.
TOWER 1 16 METER LEVEL.

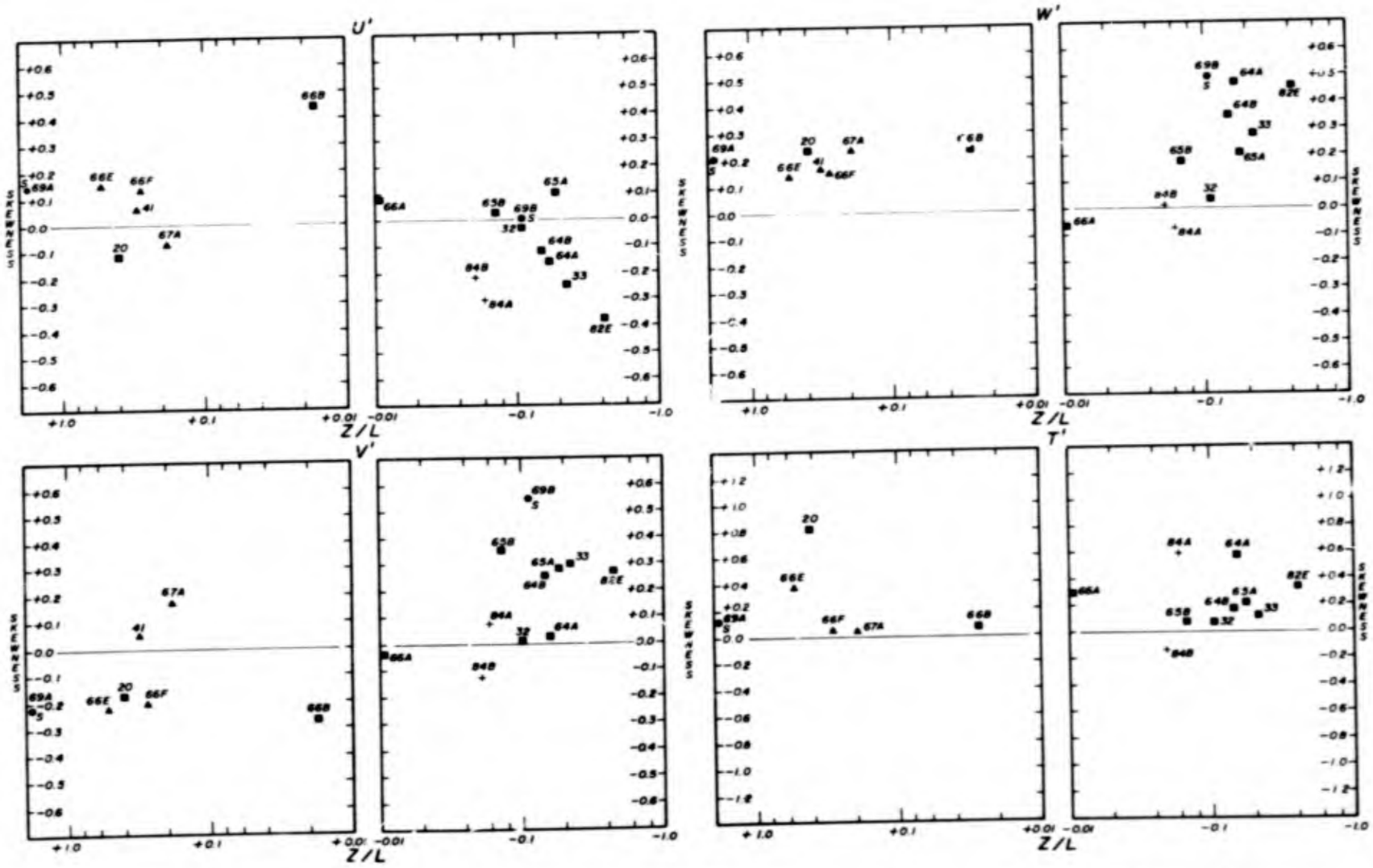

FIGURE 10. SKEWNESS OF FREQUENCY DISTRIBUTION AS FUNCTIONS OF STABILITY.
TOWER 1 40 METER LEVEL.

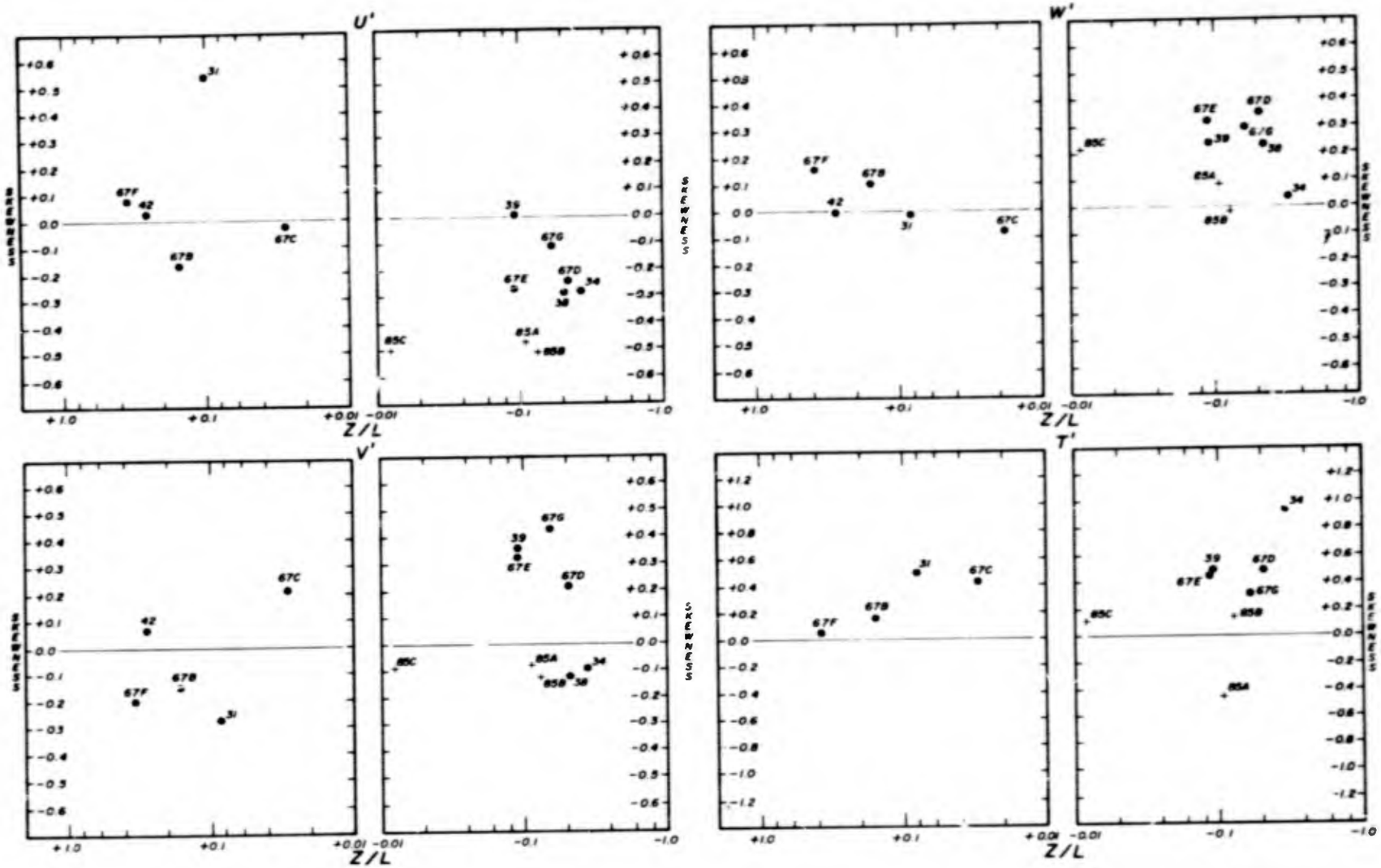

FIGURE 11. SKEWNESS OF FREQUENCY DISTRIBUTION AS FUNCTIONS OF STABILITY.
TOWER 1 40 METER LEVEL.

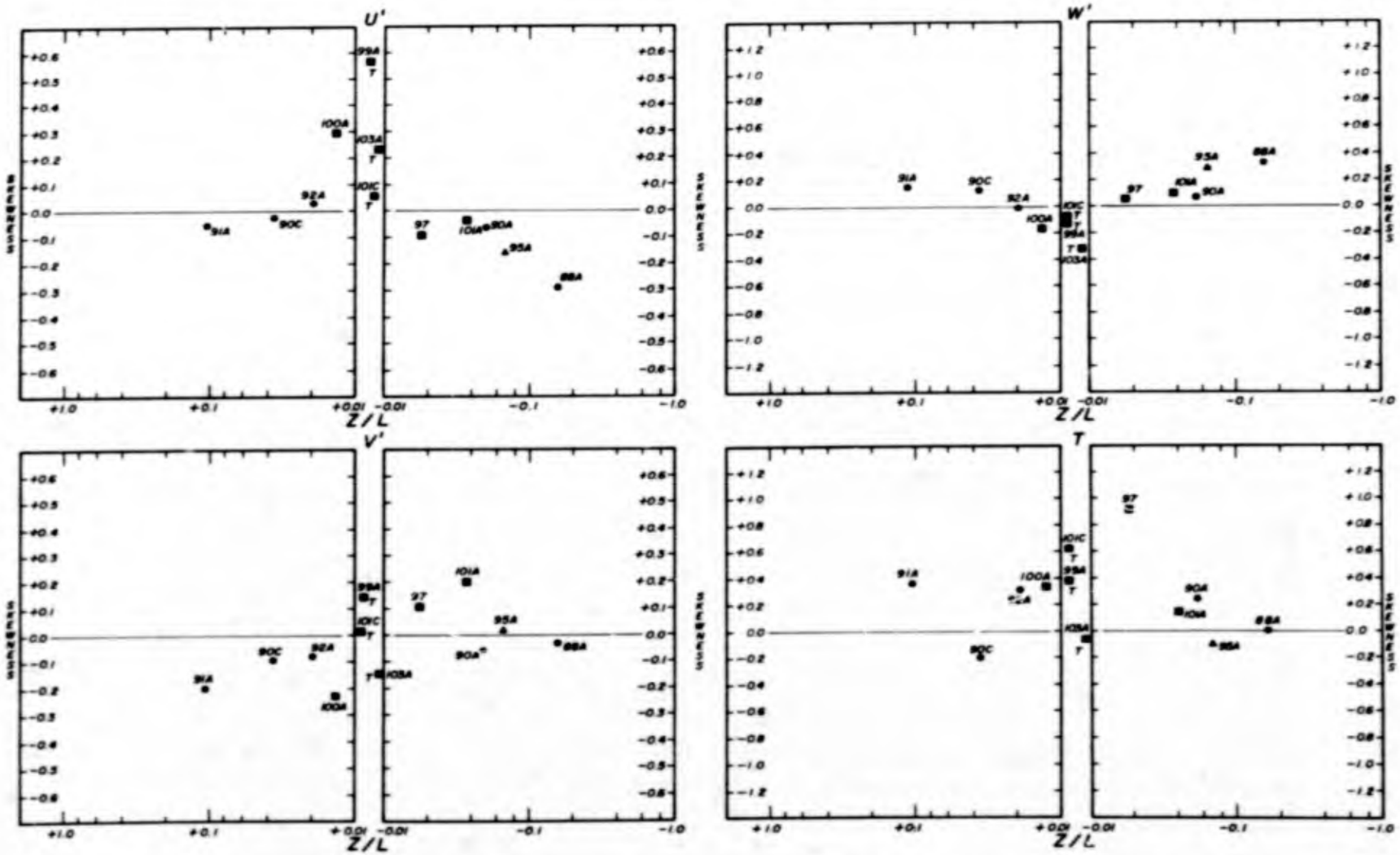

FIGURE 12. SKEWNESS OF FREQUENCY DISTRIBUTION AS FUNCTIONS OF STABILITY. TOWER 2 15 METER LEVEL.

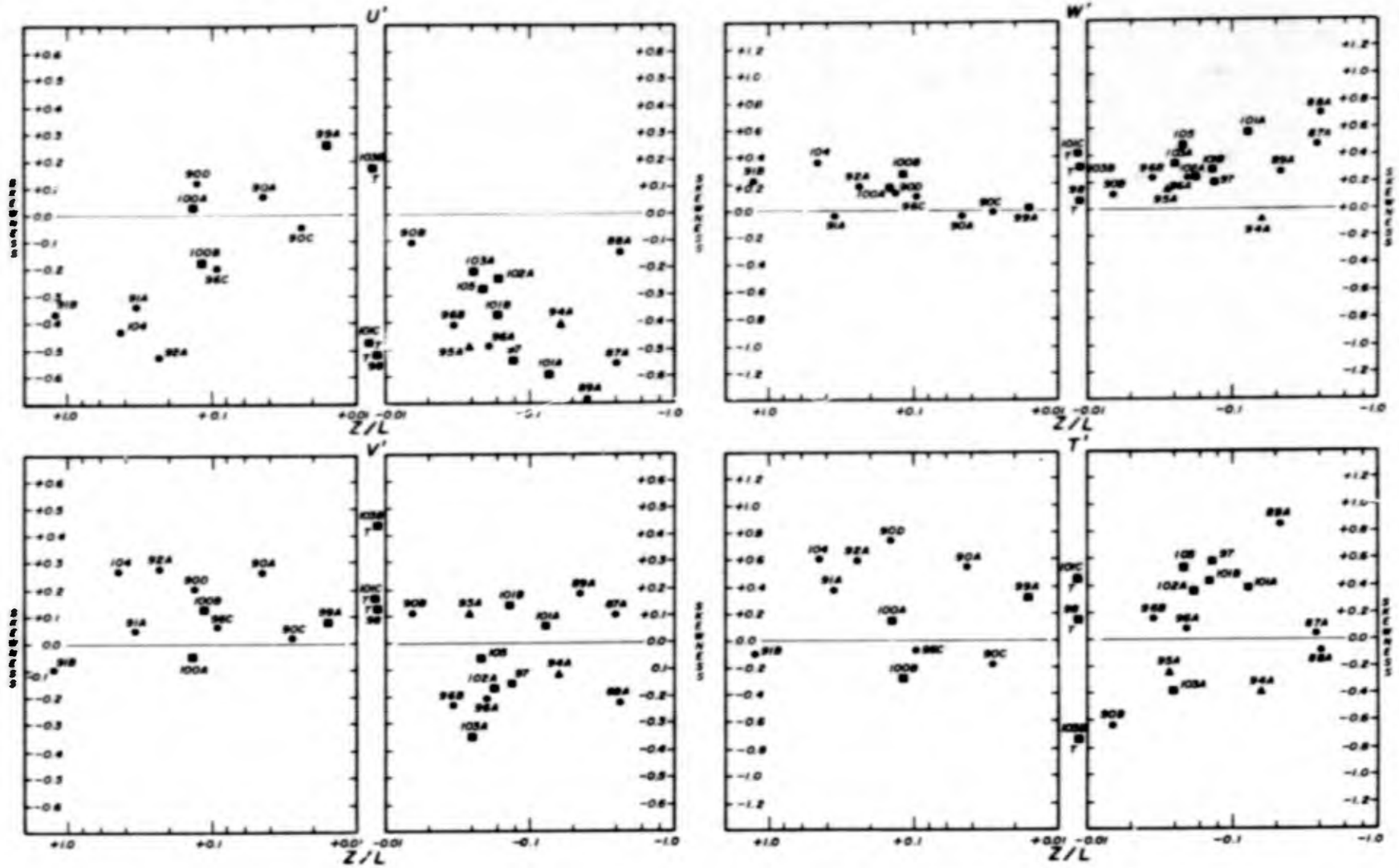

FIGURE 13. SKEWNESS OF FREQUENCY DISTRIBUTION AS FUNCTIONS OF STABILITY.
TOWER 2 46 METER LEVEL.

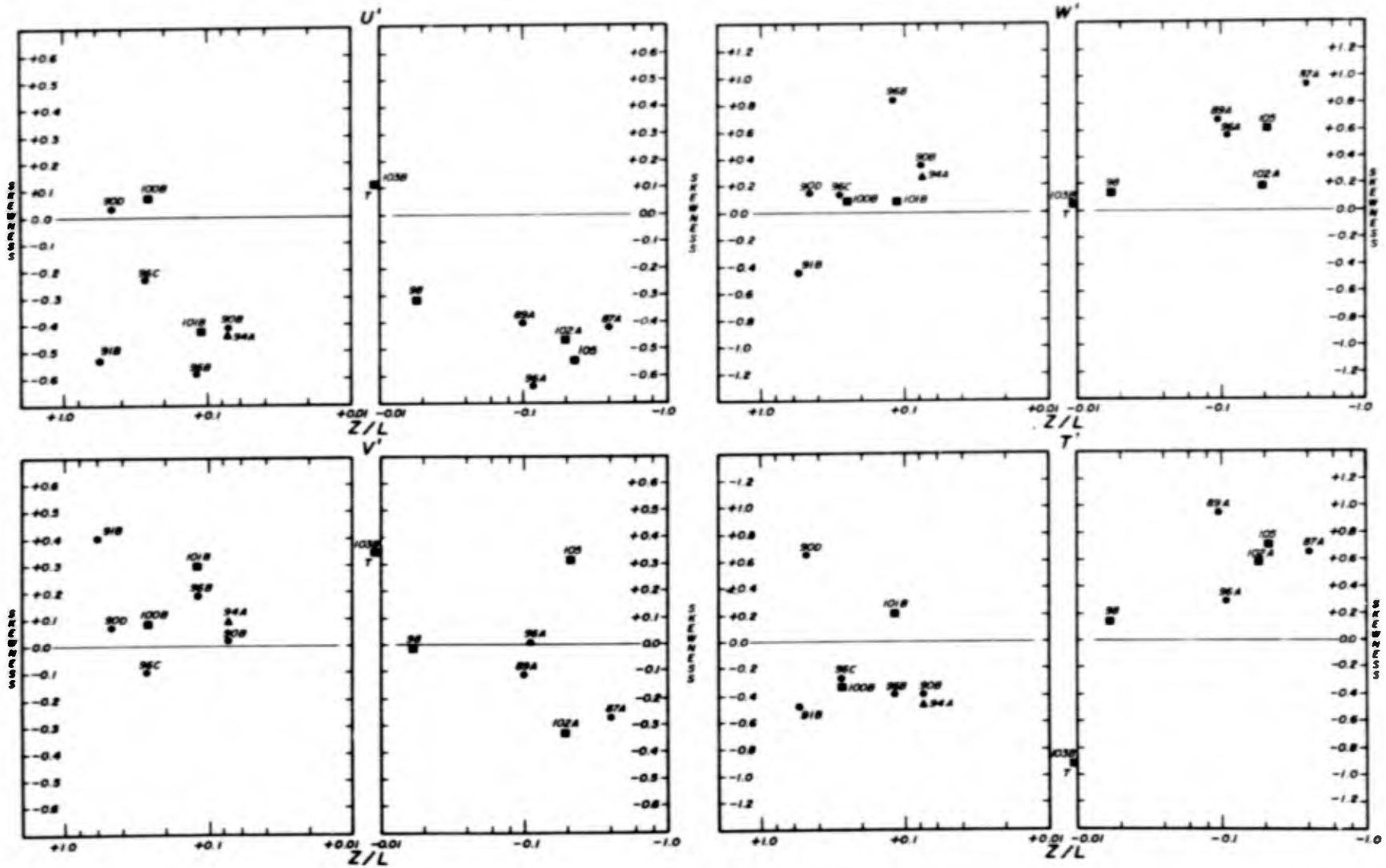

FIGURE 14. SKEWNESS OF FREQUENCY DISTRIBUTION AS FUNCTIONS OF STABILITY.
TOWER 2 91 METER IEVEL.

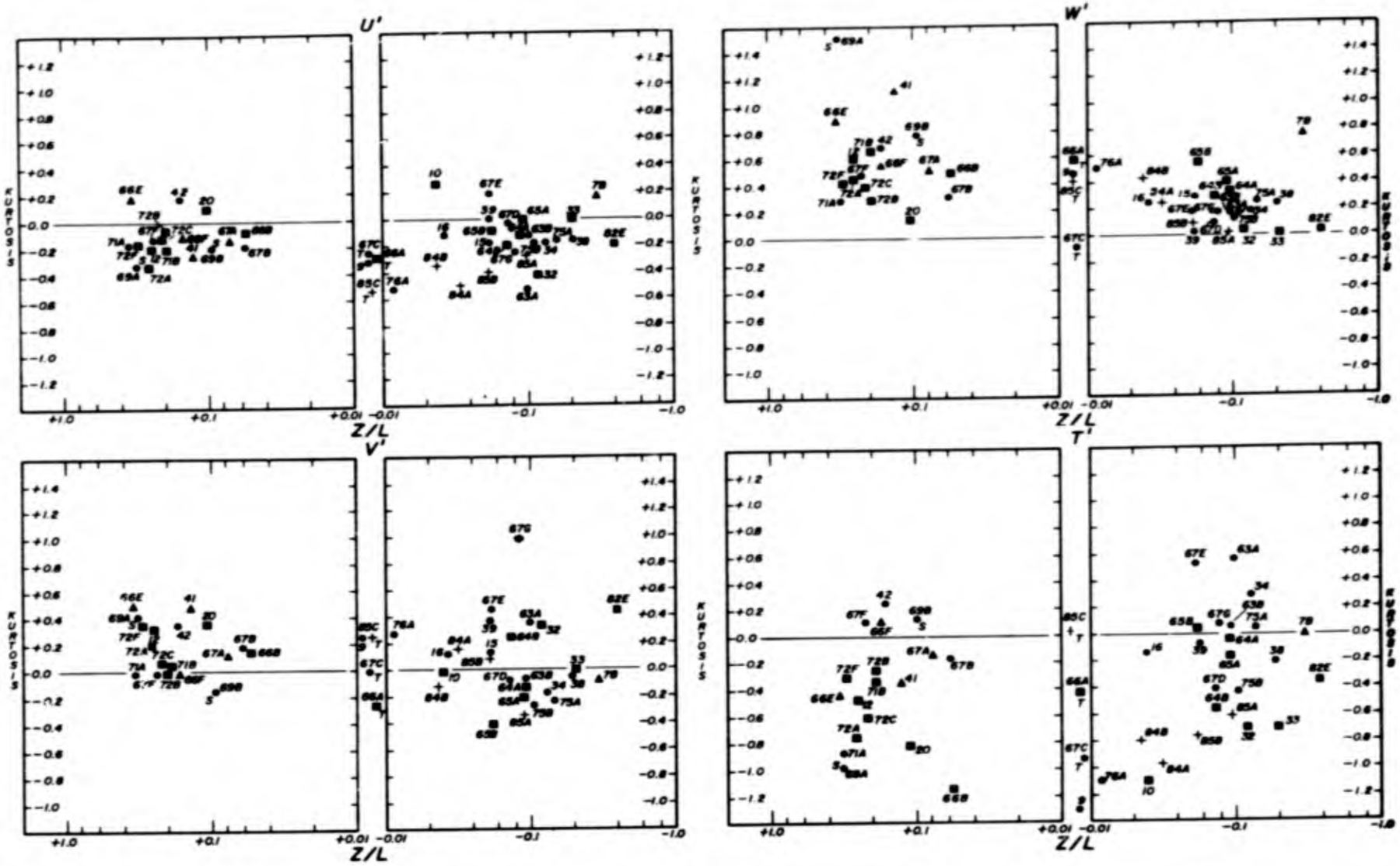

FIGURE 15. KURTOSIS OF FREQUENCY DISTRIBUTION AS FUNCTIONS OF STABILITY.
TOWER 1 16 METER LEVEL.

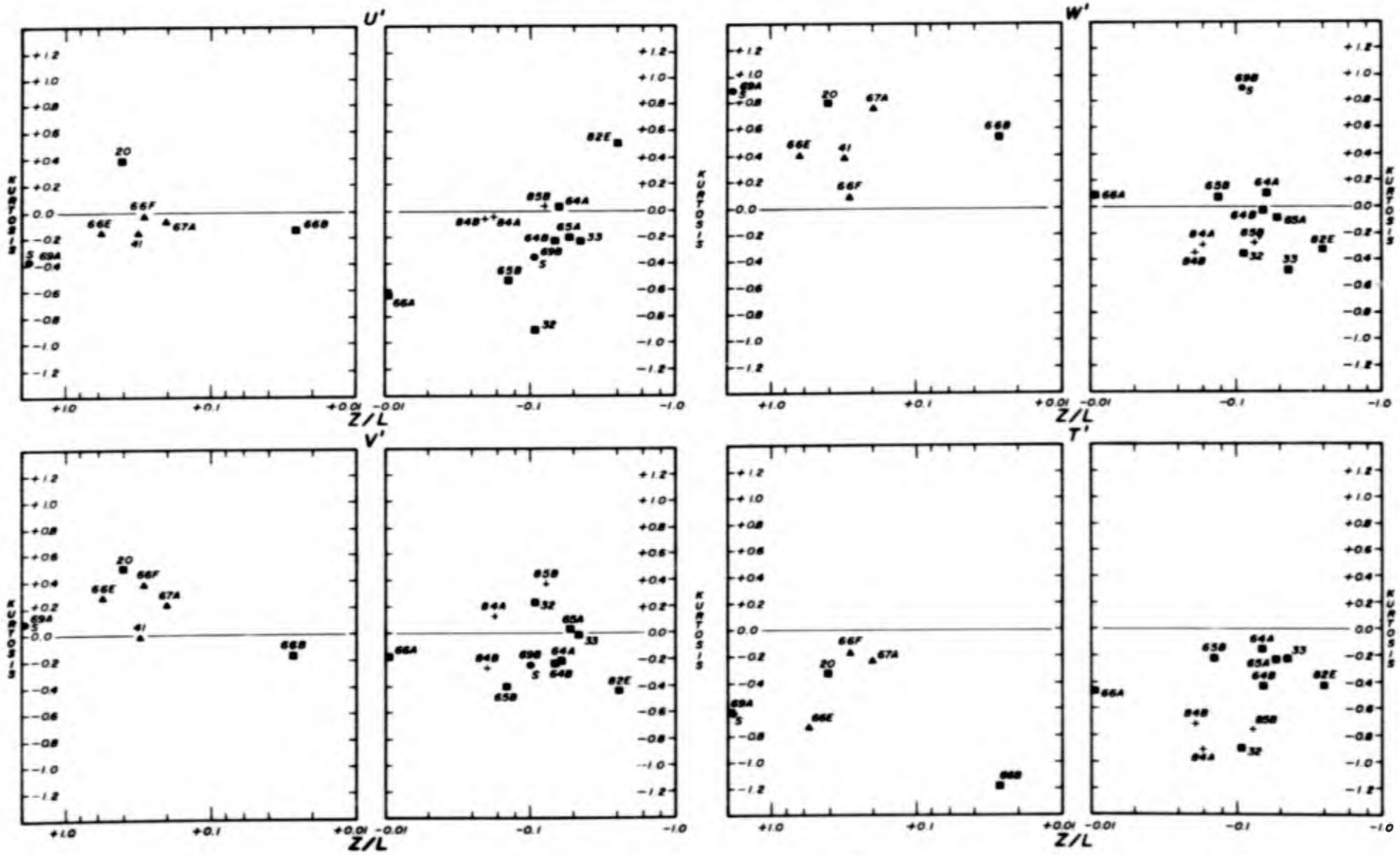

FIGURE 16. KURTOSIS OF FREQUENCY DISTRIBUTION AS FUNCTIONS OF STABILITY.
TOWER 1 40 METER LEVEL.

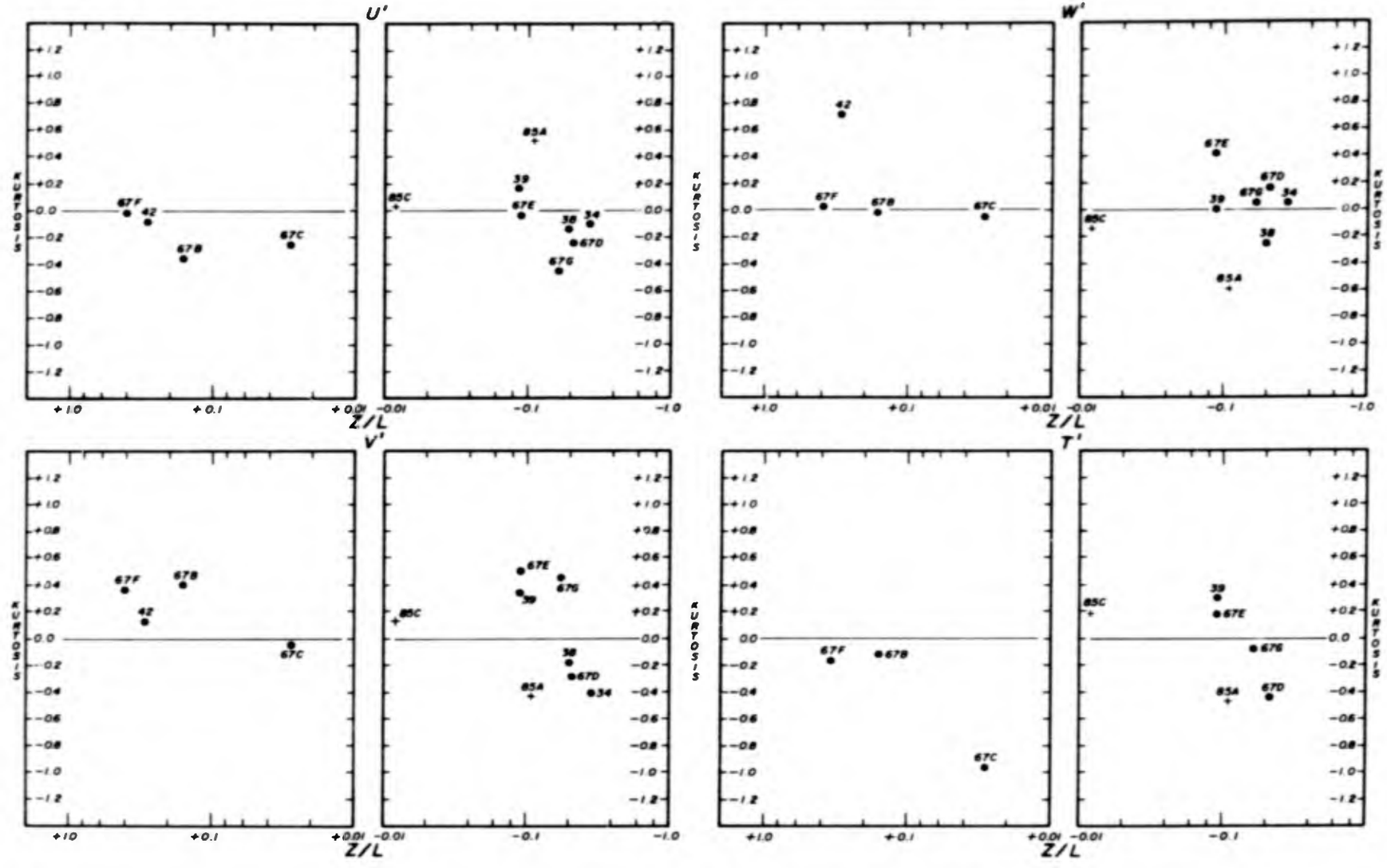

FIGURE 17. KURTOSIS OF FREQUENCY DISTRIBUTION AS FUNCTIONS OF STABILITY.
TOWER 1 40 METER LEVEL.

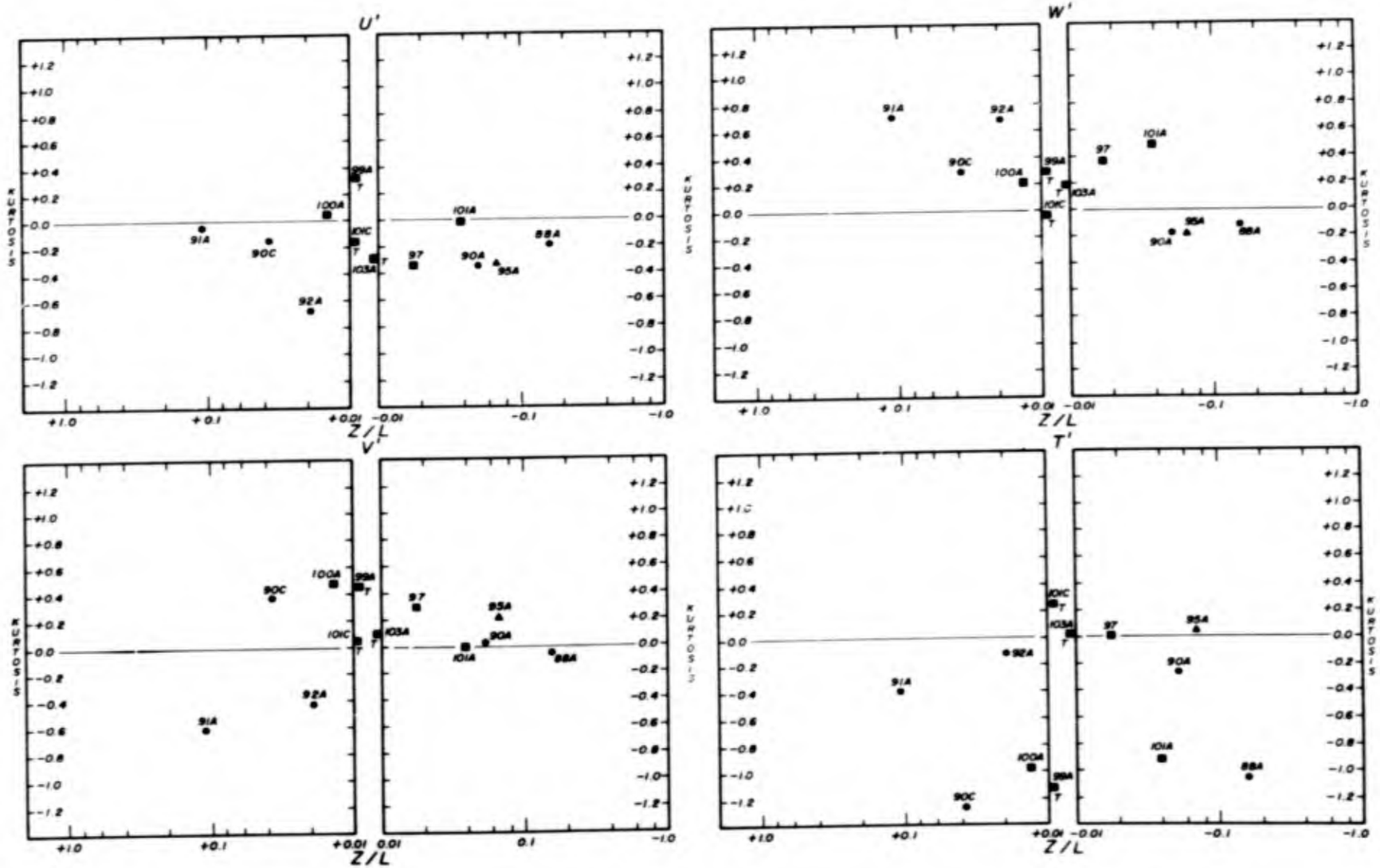

FIGURE 18. KURTOSIS OF FREQUENCY DISTRIBUTION AS FUNCTIONS OF STABILITY. TOWER 2 15 METER LEVEL.

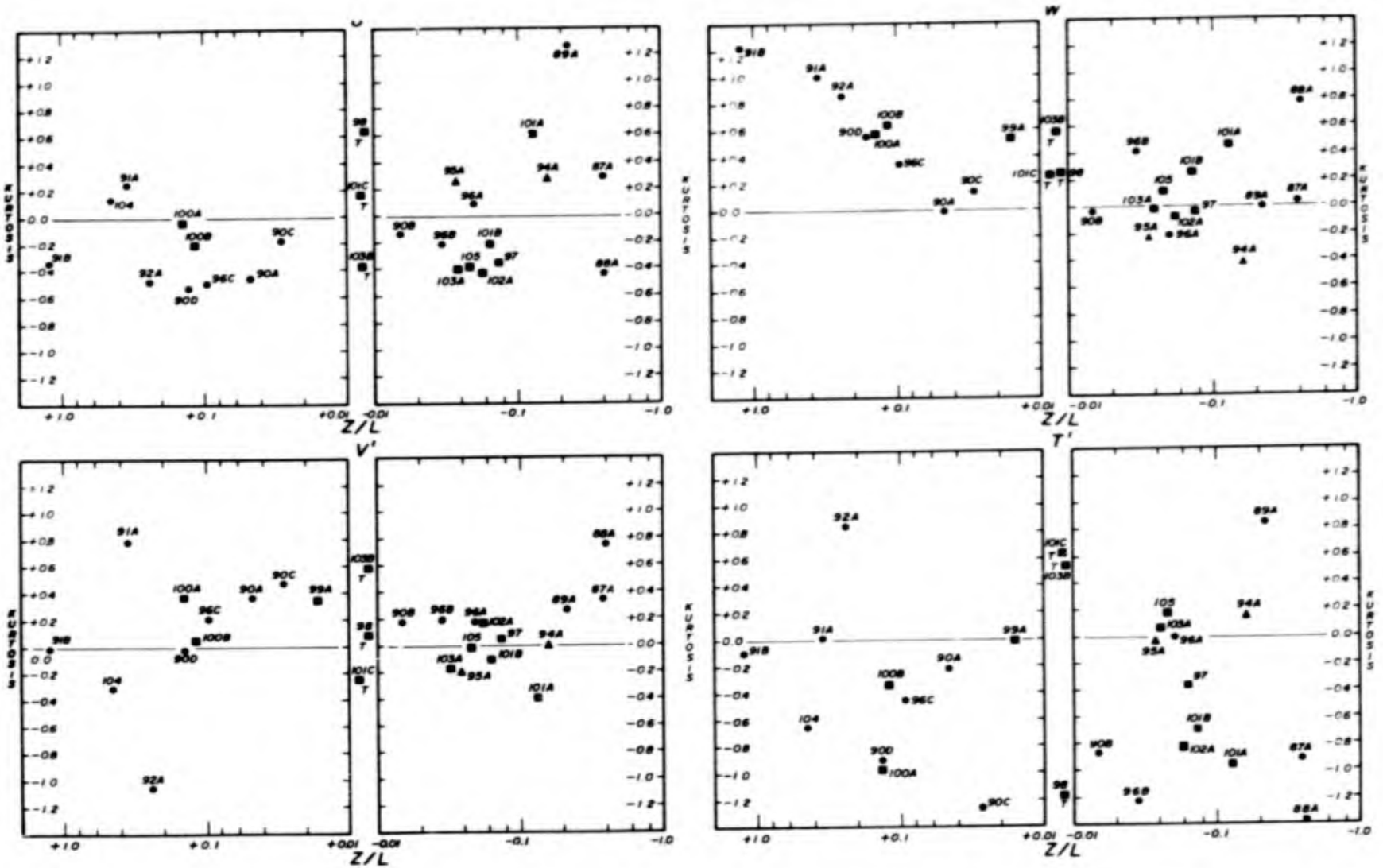

FIGURE 19. KURTOSIS OF FREQUENCY DISTRIBUTION AS FUNCTIONS OF STABILITY.
TOWER 2 46 METER LEVEL.

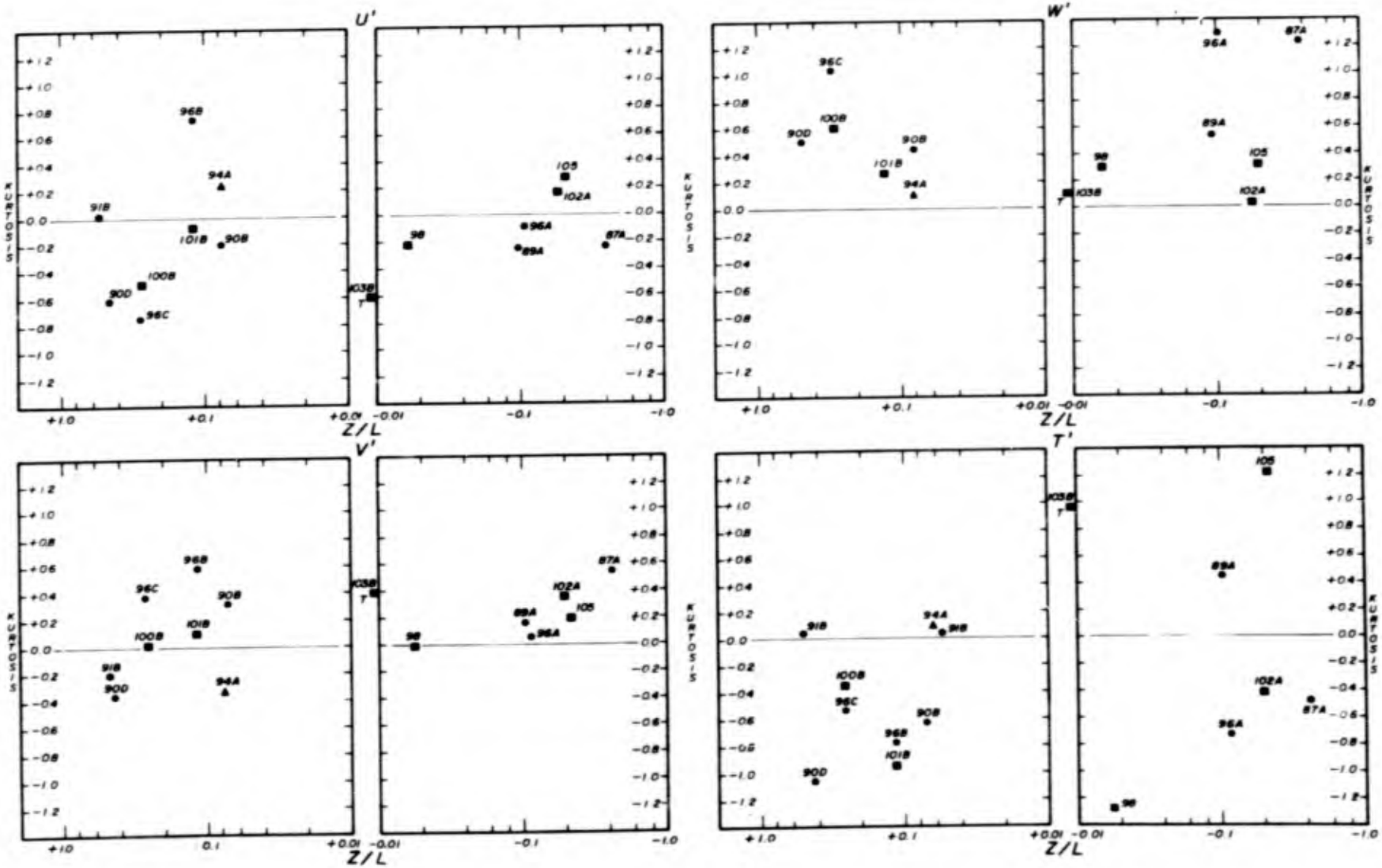

FIGURE 20. KURTOSIS OF FREQUENCY DISTRIBUTION AS FUNCTIONS OF STABILITY.
TOWER 2 91 METER LEVEL.

Data were collected at Tower 1 from November 1960 to November 1962. Wind directions were from 195 to 015 degrees. The main features of the surfaces affecting the flow are the grass and small cedars in the vicinity of the tower, the sea and tidal marsh, and finally the wooded areas to the west and north of the tower. (Figure 1)

The data from Tower 2 were collected during a short period in 1963 (June 14 to July 5). Wind directions were from 200 to 320 degrees. The main surface features are the 2-3 meter brush area surrounding the tower, the woods to the south, the farmed area and the ridge to the west, and the grass pasture and woods to the northwest.

Both tower areas have other complications such as the 1 meter lip at the edge of the marsh at Tower 1 and the root cellar surrounded by brush just slightly south of west at Tower 2.

Table 1 shows the range of values by level. Runs with wind speeds of less than 4 meters per second at the 16-meter level are not included in the plotted data, since at low wind speed sampling problems appear to make data very erratic.

The data from Tower 1 show some stability effects, but the w' distribution is the most consistent. Elliott's equation predicts internal boundary layer slopes of approximately 1:10 under neutral conditions. From this, one should expect an internal boundary layer varying about the 20-meter level caused by the change in roughness due to the tidal marsh, and another internal boundary layer in the vicinity of 40 meters in the Zone B caused by the change from the tidal marsh to the field in the woods. This change is complicated by the band of trees separating the two areas. Only the u' distributions appear to show the positive skewness one would expect from an internal boundary layer caused by the flow passing from a rough to smooth surface. The moderately stable and near neutral runs show a marked skewness in distribution. This is not so evident in data from Zone B at 40 meters. The very unstable runs in all zones are negatively skewed and the negative skewness increases with height.

The skewness of the v' distributions does not show this feature. However, the unstable side shows a tendency for the data taken in Zone B to be widely scattered. Since on the edges of this zone the changes in roughness are at an angle with the wind flow, the angle of the roughness discontinuities may affect the v' component. During stable conditions most of the observations of skewness are concentrated near zero.

TABLE 1

RANGE OF THE SKEWNESS AND
KURTOSIS OF THE DISTRIBUTION

SKEWNESS	u'	v'	w'	T'
Tower 1				
16	+0.5 to-0.3	+0.6 to-0.4	+0.5 to-0.4	+0.6 to-0.5
40	+0.5 to-0.5	+0.6 to-0.3	+0.5 to-0.1	+0.9 to-0.4
Tower 2				
15	+0.6 to-0.3	+0.2 to-0.2	+0.3 to-0.3	+0.9 to-0.2
46	+0.3 to-0.7	+0.4 to-0.4	+0.7 to-0.1	+0.9 to-0.7
91	+0.1 to-0.7	+0.4 to-0.4	+0.9 to-0.4	+1.0 to-0.9
KURTOSIS				
Tower 1				
16	+0.4 to-0.6	+1.0 to-0.4	+1.5 to-0.4	+0.6 to-1.3
40	+1.0 to-0.8	+0.6 to-0.4	+0.9 to-0.5	+0.3 to-1.2
Tower 2				
15	+0.3 to-0.6	+0.5 to-0.6	+0.7 to-0.2	+0.3 to-1.2
46	+1.2 to-0.6	+0.8 to-1.0	+1.2 to-0.4	+0.9 to-1.3
91	+0.8 to-0.8	+0.6 to-0.4	+1.4 to 0.0	+1.2 to-1.2

The skewness of the w' component becomes more positive with increasing instability and tends to increase with height. Contrary to Gurvich's (1960) findings, there appears to be some stability dependence and the range is somewhat larger.

The T' distributions show a great scatter, but are predominantly positively skewed.

The range of the kurtosis of the distributions shows no evident effect of internal boundary layers, and only the kurtosis of w' seems stability dependent. The u' and T' distributions tend to be flattened and v' is grouped around a zero kurtosis.

The skewness of the u' distribution on Tower 2 also shows the effects of internal boundary layers. The 15-meter Zone C runs, during near neutral conditions, tend to show marked positive skewness when the grass fetch between the brush and woods is quite short (less than 100 meters). Zone B runs tend to be negatively skewed. The exceptions are runs with the wind flow over the root cellar and a few runs in Zone C. This is consistent with a change from a smooth to rough surface at some distance from the tower. Only in Zone C, when the orientation of the roughness change is at a marked angle to the wind flow, and two runs in which the flow is over the patch of brush in the middle of the field in Zone B, does the skewness of v' depart greatly from zero.

The stability and height dependence of the w' distribution is even more pronounced in the Tower 2 data.

The skewness of the T' distributions appears to show a stability dependence at 91-meters that is not evident in the lower levels. Both Tower 1 data and that from the 15- and 46-meter levels at Tower 2 are mostly positively skewed regardless of stability.

A 601-point (12.02 minute) running mean filter removes the trends in the data and reduces the effect of oscillations with periods greater than 12 minutes. The filtered data shows less scatter when plotted against stability. The skewness of u' distribution is reduced, but retains much the same shape on the stability diagram. The apparent stability dependence is more clear-cut. Filtering the T' distribution reduces the scatter only slightly, but gravely increases the stability dependence on the unstable side. The distribution of T' frequently has a bimodal peak which is removed by the filter.

Unfiltered and filtered data are tabulated in Annex A.

V. SUMMARY AND CONCLUSIONS

The chi-square test shows that the frequency distributions of the turbulent components of wind and temperature over the Round Hill Field Site can rarely be considered Gaussian. Although these results appear contradictory to the usual assumption and to the results of other investigators, when one considers the characteristics of the site, the results are not surprising. The departure of the distributions of the wind components in terms of skewness and kurtosis are not usually extreme (rarely more than ±0.6 for skewness and ±1.0 for the kurtosis), so the advisability of using the Gaussian assumption must depend on the requirements of the problem being treated.

The skewness of the observed distributions was related to the vertical variation of the standard deviation of the wind components, which is caused by variations in the upwind surface characteristics. No quantitative values were determined, but in a qualitative sense the agreement appears quite good. The variation of wind speed with height can frequently be quite large. Any measuring system based on sensing T' at a single level should not be used in areas with inhomogeneous terrain.

From these data, it is obvious that equilibrium conditions rarely exist at the levels where the turbulence was measured. Quantities derived from the data under this assumption are probably not valid. However, in practical problems where conditions are far from ideal, these data should be valuable research material. An unanswered question is what role the zero-plane displacement associated with the roughness change plays in turbulent structure. In each of the major roughness changes at Round Hill, a zero-plane displacement is involved, e.g., the meter high lip between the marsh and grass cover; the 2-meter rise of the beach near the shore; and 6-10 meter high trees to much lower vegetation. It may be the large vertical variation in the u' is in part due to turbulent layers generated by pressure fluctuation at the zero-plane displacement points. Another question is that of the distance downwind that the flow is affected by these discontinuities. Certainly it must be related to the magnitude of the change. Horn and Trawle (1964) have published data that indicates fairly large obstacles (mountain peaks) affect the standard deviation of the u' at the surface 12 kilometers downwind.

In spite of the questions, we believe the material presented shows the internal boundary layer theories are useful concepts and lead to a much better understanding of the vertical structure of turbulence over non-homogeneous

terrain. The wind tunnel data and atmospheric data appear to show similar features. Complementing the wind tunnel studies with a similar set of field measurements downwind from roughness discontinuities and obstacles may assist in developing empirical scaling techniques for studying the effects of terrain on turbulent structure.

Certainly the current logarithmic spacing of anemometers and other sensors is not adequate to determine the structure in the vicinity of internal boundary layers.

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ANNEX A - DATA TABULATIONS

Standard deviations, skewness, kurtosis, and the stability parameter are listed according to run. Tower 1 is listed first.

The computations are also shown after a 601-point running mean and a 101-point running mean were taken on Tower 1, and after a 601-point running mean and a 61-point running mean on Tower 2.

The abbreviations are defined as follows:

SDU - Standard deviation of u' (σu).

SDV - Standard deviation of v' (σv).

SDW - Standard deviation of w' (σw).

SDT - Standard deviation of t' (σt).

z/L - Monin and Obukhov stability parameter.

SKU - Skewness coefficient of the u' velocity component.

KTU - Kurtosis coefficient of the u' velocity component.

SKV - Skewness coefficient of the v' velocity component.

KTV - Kurtosis coefficient of the v' velocity component.

SKW - Skewness coefficient of the w' velocity component.

KTW - Kurtosis coefficient of the w' velocity component.

SKT - Skewness coefficient of the T' velocity component.

KTT - Kurtosis coefficient of the T' velocity component.

RUN NO. 7B 16 11-22-60 1105-1204 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.862	0.937	0.419	0.327	-0.299	-0.198	0.186	-0.186	-0.082	0.531	0.754	0.565	0.003

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.812	0.902	0.397	0.224	-0.243	-0.174	-0.339	-0.089	-0.004	0.420	0.707	1.058	1.479

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.619	0.606	0.370	0.166	-0.404	-0.471	2.516	-0.261	0.982	0.273	0.701	1.155	2.396

RUN NO. 9 16P 11-23-60 1431-1531 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.439	1.228	0.657	0.280	0.001	0.128	-0.290	-0.064	0.307	-0.238	0.440	-0.373	-1.316

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.254	1.141	0.657	0.027	0.003	0.153	-0.366	0.100	0.232	-0.229	0.341	-0.205	0.442

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.934	1.006	0.640	0.022	0.004	0.077	0.182	-0.109	0.958	-0.264	0.540	-0.408	1.657

RUN NO. 10 16P 11-23-60 2000-2100 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.894	0.672	0.296	0.383	-0.024	0.484	0.259	0.273	-0.041	0.166	1.844	0.150	-1.099

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.874	0.609	0.294	0.131	0.009	0.349	0.156	0.070	0.715	0.102	1.838	0.089	0.172

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.847	0.564	0.292	0.122	0.009	0.288	0.547	0.073	1.118	0.068	1.804	-0.112	0.383

RUN NO. 12 16P 11-23-60 2230-2330 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.610	0.470	0.269	0.237	0.252	0.021	-0.187	-0.063	0.336	0.035	0.591	-0.325	-0.463

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.567	0.412	0.268	0.158	0.260	0.175	-0.043	-0.055	0.379	0.005	0.726	0.117	0.168

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.549	0.403	0.264	0.153	0.274	0.278	0.196	-0.016	0.328	0.004	0.646	0.056	0.302

RUN NO. 15 16P 12-02-60 1430-1530 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.146	1.012	0.513	0.141	-0.054	0.256	-0.192	-0.258	0.110	0.163	0.296	0.612	1.577

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.861	0.812	0.506	0.123	-0.056	0.128	-0.127	-0.105	0.203	0.007	0.392	0.643	2.083

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.652	0.627	0.465	0.106	-0.065	0.025	0.631	-0.034	0.292	0.122	0.694	0.187	0.809

RUN NO. 16 16M 12-07-60 1206-1309 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.882	2.161	0.828	0.430	-0.026	-0.182	-0.135	0.159	0.117	0.141	0.233	0.295	-0.170

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.350	1.727	0.814	0.255	-0.052	-0.178	0.313	0.013	-0.387	0.095	0.346	0.654	0.288

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.190	1.275	0.777	0.184	-0.057	-0.195	0.141	0.065	0.256	0.106	0.362	0.339	0.553

RUN NO. 20 [illegible] 07-01-61 0035-0136 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.793	0.698	0.446	0.414	0.109	0.318	0.101	-0.100	0.354	0.062	0.137	0.610	-0.803

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.773	0.598	0.445	0.177	0.122	0.295	0.049	0.111	0.009	0.040	0.110	0.090	-0.233

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.714	0.582	0.438	0.159	0.127	0.314	0.149	0.141	0.099	0.030	0.079	0.190	0.139

RUN NO. 20 40M 07-01-61 0035-0136 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.709	0.628	0.391	0.407	0.410	-0.122	0.395	-0.185	0.489	0.238	0.814	0.822	-0.327

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.666	0.500	0.391	0.184	0.441	-0.055	0.586	-0.107	0.456	0.285	0.807	0.080	-0.025

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.611	0.483	0.385	0.169	0.457	-0.103	0.447	-0.110	0.317	0.255	0.796	0.163	0.375

RUN NO. 32 16M 10-05-61 0833-0934 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.622	1.614	0.850	0.550	-0.116	-0.008	-0.417	0.215	0.336	-0.149	0.044	0.213	-0.695

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.334	1.531	0.847	0.313	-0.097	0.020	-0.368	0.292	-0.004	-0.177	0.111	0.571	0.383

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.954	1.111	0.799	0.186	-0.158	-0.077	-0.000	-0.031	0.069	-0.103	0.267	0.602	0.690

RUN NO. 32 40M 10-05-61 0833-0934 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.956	1.372	1.024	0.495	-0.109	-0.021	-0.912	0.008	0.223	0.031	-0.322	0.072	-0.898

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.690	1.293	1.027	0.236	-0.095	-0.141	-0.513	0.246	0.004	0.010	-0.358	0.412	-0.280

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.092	1.040	0.936	0.157	-0.169	-0.349	0.560	0.019	0.090	-0.026	-0.068	0.390	0.104

RUN NO. 33 16M 10-05-61 1049-1150 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.310	1.639	0.700	0.547	-0.200	-0.139	-0.014	0.378	-0.020	0.043	-0.006	0.198	-0.717

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.257	1.511	0.701	0.362	-0.193	-0.110	-0.362	0.078	-0.412	0.035	-0.015	0.455	-0.280

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.080	1.049	0.687	0.262	-0.808	2.174	8.115	-0.060	-0.180	0.186	0.187	0.547	0.667

RUN NO. 33 40M 10-05-61 1049-1150 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.631	1.477	0.863	0.479	-0.218	-0.249	-0.226	0.300	-0.044	0.275	-0.475	0.117	-0.230

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.574	1.362	0.862	0.351	-0.192	-0.285	-0.032	0.085	-0.370	0.214	-0.499	0.752	0.534

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.986	1.025	0.752	0.231	-0.477	-0.229	0.592	0.751	4.039	1.457	4.082	0.666	0.634

RUN NO. 34 16M 10-05-61 1338-1439 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.354	1.456	0.627	0.316	-0.132	-0.198	-0.180	-0.114	-0.179	-0.028	0.179	0.513	0.293

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.235	1.316	0.624	0.269	-0.149	-0.221	-0.119	0.022	0.036	-0.106	0.248	0.490	0.072

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.774	0.874	0.562	0.211	-0.222	-0.206	0.730	0.014	1.219	-0.138	0.521	0.561	0.433

RUN NO. 34 40M 10-05-61 1338-1439 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.619	1.564	0.878	0.342	-0.284	-0.296	-0.095	-0.091	-0.423	0.057	0.048	0.952	1.538

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.335	1.372	0.868	0.279	-0.332	-0.296	-0.407	0.008	-0.355	-0.020	0.030	0.820	0.774

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.797	0.912	0.736	0.178	-0.665	-0.319	0.824	-0.077	0.975	0.074	0.158	0.713	0.725

RUN NO. 38 16M 10-16-61 1209-1315 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.516	2.101	0.719	0.474	-0.193	-0.263	-0.149	-0.009	-0.038	0.159	0.227	0.168	-0.207

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.403	1.719	0.703	0.375	-0.209	-0.279	-0.131	0.311	0.230	0.129	0.243	0.226	-0.466

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.887	1.146	0.640	0.255	-0.284	-0.047	-0.124	0.240	0.723	0.072	0.458	0.348	0.126

RUN NO. 38 40M 10-16-61 1209-1315 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.715	2.116	1.032		-0.203	-0.278	-0.137	-0.132	-0.229	0.212	-0.253		

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.551	1.436	1.002		-0.170	-0.319	0.114	0.371	0.167	0.186	-0.174		

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.079	1.138	0.867		-0.319	-0.274	-0.006	0.236	0.832	0.128	0.110		

RUN NO. 39 10M 10-16-61 1427-1528 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.554	1.519	0.670	0.236	-0.054	0.359	-0.009	0.458	0.374	-0.101	0.019	0.388	-0.084

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.346	1.241	0.669	0.195	-0.053	-0.013	0.083	0.218	0.365	-0.102	0.028	0.280	0.099

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.017	0.920	0.653	0.131	-0.053	-0.049	0.153	0.111	0.223	-0.086	-0.018	0.334	0.823

RUN NO. 39 40M 10-16-61 1427-1528 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.797	1.690	0.879	0.220	-0.092	0.017	0.162	0.355	0.278	0.242	0.000	0.476	0.278

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.526	1.393	0.879	0.201	-0.091	-0.483	0.761	0.062	0.252	0.153	0.030	0.512	0.844

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.084	1.021	0.795	0.126	-0.109	-0.400	0.261	-0.075	0.353	0.175	0.317	0.380	1.240

RUN NO. 41 10M 10-16-61 2044-2145 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.594	0.618	0.402	0.190	0.137	0.351	-0.225	0.134	0.481	0.027	1.111	0.117	-0.330

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.752	0.564	0.401	0.160	0.139	0.371	0.210	0.394	0.974	-0.124	1.336	0.156	0.170

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.670	0.546	0.394	0.142	0.139	0.300	0.192	0.417	1.123	-0.096	0.945	0.084	0.206

RUN NO. 41 40M 10-16-61 2044-2145 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.808	0.699	0.463		0.324	0.062	-0.156	0.054	-0.029	0.174	0.383		

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.781	0.634	0.463		0.360	0.152	-0.150	0.130	0.270	0.166	0.441		

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.698	0.613	0.454		0.370	-0.029	-0.102	0.185	0.341	0.089	0.277		

RUN NO. 42 16M 10-16-61 2111-2312 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.621	C.545	C.387	0.157	0.165	0.419	0.177	0.036	C.355	-0.234	0.689	0.084	0.265

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.707	C.524	C.385	0.144	0.134	0.524	0.627	0.050	0.355	-0.273	0.723	0.201	0.225

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.669	C.512	C.379	0.134	0.137	0.362	0.370	0.060	0.303	-C.216	0.616	0.113	0.152

RUN NO. 42 40M 10-16-61 2111-2312 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.879	0.594	C.447		0.290	C.020	-0.082	0.076	C.118	-0.007	0.708		

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.761	C.571	C.445		0.337	0.090	0.203	-0.006	C.390	-C.081	0.570		

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.718	C.561	C.441		0.356	-C.102	0.044	-0.028	0.451	0.037	0.723		

RUN NO. 63A 16M 05-07-62 1037-1153 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.977	2.171	0.793	0.493	-0.101	0.079	-0.536	0.046	C.355	0.153	0.126	0.492	0.565

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.799	1.882	0.793	0.469	-0.117	-0.114	-0.492	0.169	0.329	0.110	0.162	0.629	0.697

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.157	1.324	0.756	0.356	-0.165	-0.028	0.142	0.224	C.459	-0.002	0.287	0.605	0.976

RUN NO. 63B 16M 05-07-62 1207-1323 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.777	2.290	C.807	0.475	-0.095	-0.015	-0.132	-0.064	-0.078	0.047	0.144	0.511	0.062

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.623	2.128	0.805	0.433	-0.103	0.003	-0.184	-0.219	-0.263	0.124	0.067	0.307	0.046

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.254	1.308	C.771	0.342	-0.135	-0.086	0.112	0.085	C.508	C.090	0.178	0.417	0.159

RUN NO. 64A 16M 05-09-62 0941-1057 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.291	2.135	C.854	0.615	-0.093	C.029	-0.131	0.122	-C.140	0.048	0.318	0.538	-0.033

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.094	1.841	0.853	0.468	-0.094	0.171	-0.261	-0.137	C.037	0.009	0.358	0.258	0.226

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.441	1.450	C.816	0.357	-0.130	-C.042	0.009	0.014	0.263	-C.031.	0.412	0.470	0.298

RUN NO. 64A 40M 05-09-62 0941-1057 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.230	1.922	1.156	0.534	-0.165	-0.153	0.025	0.024	-0.230	0.477	0.104	0.571	-0.156

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.968	1.649	1.148	0.400	-0.183	0.111	-0.074	-0.324	-0.088	0.436	0.137	0.321	0.268

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.255	1.301	1.074	0.289	-0.276	-0.068	0.636	-0.134	0.287	0.338	0.139	0.540	0.385

RUN NO. 64B 16M 05-09-62 1103-1216 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.412	2.825	0.920	0.569	-0.074	0.157	-0.192	0.302	0.227	0.152	0.292	0.161	-0.567

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.295	2.722	0.919	0.489	-0.069	0.209	-0.418	0.034	0.257	0.109	0.263	0.452	-0.104

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.654	1.819	0.904	0.393	-0.084	0.182	-0.110	0.005	0.182	0.100	0.198	0.442	0.234

RUN NO. 64B 40M 05-09-62 1103-1216 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.201	2.414	1.082	0.510	-0.148	-0.122	-0.217	0.258	-0.242	0.352	-0.015	0.169	-0.433

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.063	2.425	1.070	0.434	-0.161	-0.033	-0.508	0.167	-0.052	0.409	0.104	0.558	-0.192

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.414	1.508	1.008	0.311	-0.212	-0.122	-0.068	0.113	0.324	0.268	0.088	0.426	0.211

RUN NO. 65A 16M 05-09-62 1304-1420 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.068	2.453	0.894	0.481	-0.092	0.286	0.002	0.212	-0.212	-0.079	0.376	0.213	-0.151

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.937	2.379	0.891	0.400	-0.092	0.294	-0.088	0.053	-0.176	-0.155	0.302	0.387	0.258

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.540	1.546	0.870	0.335	-0.095	0.103	0.055	-0.035	0.103	-0.063	0.505	0.473	0.296

RUN NO. 65A 40M 05-09-62 1304-1420 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.021	2.167	1.110	0.456	-0.185	0.099	-0.199	0.289	0.014	0.217	-0.080	0.212	-0.242

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.863	2.076	1.103	0.374	-0.179	0.170	-0.192	0.006	-0.162	0.207	-0.052	0.362	-0.034

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.353	1.405	1.062	0.281	-0.231	-0.140	0.370	0.060	0.270	0.230	0.070	0.417	0.278

RUN NO. 65B 16M 05-09-62 1434-1550 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.399	2.998	0.859	0.390	-0.056	0.154	-0.070	0.289	-0.422	-0.089	0.534	0.062	0.053

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.011	2.02[illegible]	0.855	0.325	-0.054	0.062	-0.130	-0.093	0.123	-0.231	0.543	0.437	0.221

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.516	1.561	0.929	0.256	-0.066	0.058	0.065	-0.117	0.490	-0.138	0.632	0.487	0.570

RUN NO. 65B 40M 05-09-62 1434-1550 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	[illegible]W	SKT	KTT
2.311	2.707	1.009	0.365	-0.072	0.023	-0.542	0.346	-0.415	0.185	0.076	0.047	-0.221

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.876	1.791	0.994	0.291	-0.088	-0.025	-0.394	0.062	0.134	0.144	0.094	0.399	0.035

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.332	1.361	0.943	0.216	-0.143	-0.143	-0.038	0.061	0.363	0.156	0.193	0.402	0.347

RUN NO. 66A 16M 05-09-62 1650-1806 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.041	1.775	0.711	0.279	-0.008	0.176	-0.291	-0.082	-0.271	-0.102	0.571	0.291	-0.432

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.679	1.438	0.708	0.103	-0.009	0.079	-0.038	-0.175	0.044	-0.119	0.562	0.472	2.875

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.293	1.172	0.691	0.058	-0.008	0.112	0.061	-0.069	0.056	-0.085	0.629	-0.220	5.064

RUN NO. 66A 40M 05-09-62 1650-1806 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.029	1.728	0.868	0.236	-0.010	0.079	-0.632	-0.037	-0.212	-0.056	0.087	0.297	-0.474

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.703	1.341	0.854	0.106	-0.036	-0.089	-0.396	-0.026	0.135	-0.043	0.041	0.126	0.871

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.204	1.112	0.911	0.055	-0.034	-0.023	-0.147	-0.014	0.154	-0.087	0.394	0.066	2.067

RUN NO. 66B 16M 05-09-62 1818-1934 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.460	1.239	0.618	0.455	0.056	0.509	-0.087	-0.444	0.161	-0.059	0.486	0.021	-1.134

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.322	0.986	0.616	0.141	0.055	0.319	-0.017	-0.114	0.541	0.041	0.477	-0.383	0.510

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.063	0.885	0.599	0.123	0.067	0.294	0.122	-0.119	0.603	-0.080	0.622	-0.412	0.716

RUN NO. 66B 40M 05-09-62 1818-1934 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.445	1.220	0.731	0.408	0.028	0.452	-0.136	-0.273	-0.171	0.244	0.530	0.074	-1.176

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.347	0.983	0.732	0.102	0.068	0.230	-0.278	0.042	0.555	0.201	0.568	-0.002	0.396

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.120	0.907	0.701	0.088	0.077	0.104	-0.218	0.080	0.450	0.074	0.390	-0.127	0.479

RUN NO. 66E 16M 05-09-62 2248-0004 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.713	0.420	0.248	0.302	0.338	0.455	0.178	0.140	0.502	-0.137	0.917	0.541	-0.421

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.548	0.386	0.248	0.141	0.248	0.395	0.603	0.265	0.599	-0.192	0.852	-0.154	0.087

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.522	0.378	0.246	0.136	0.241	0.319	0.234	0.247	0.609	-0.197	0.947	-0.169	-0.020

RUN NO. 66E 40M 05-09-62 2248-0004 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.732	0.517	0.305	0.326	0.552	0.149	-0.159	-0.224	0.265	0.146	0.421	0.380	-0.742

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.574	0.460	0.303	0.141	0.479	-0.125	-0.079	0.033	0.253	0.105	0.204	0.186	0.008

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.541	0.446	0.300	0.132	0.499	-0.100	0.049	0.055	0.404	0.120	0.398	0.064	0.009

RUN NO. 66F 16M 05-10-62 0018-0134 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.886	0.615	0.369	0.186	0.166	0.372	-0.113	-0.040	-0.013	-0.155	0.569	-0.168	0.124

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.865	0.572	0.368	0.182	0.165	0.243	-0.206	0.018	0.165	-0.153	0.539	-0.040	-0.122

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.775	0.565	0.362	0.167	0.176	0.252	-0.047	0.016	0.168	-0.146	0.601	-0.013	0.099

RUN NO. 66F 40M 05-10-62 0018-0134 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.841	0.659	0.434	0.176	0.292	0.131	-0.037	-0.207	0.358	0.161	0.089	0.054	-0.176

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.807	0.628	0.434	0.171	0.305	-0.007	-0.198	-0.004	0.088	0.177	0.107	0.056	-0.171

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.742	0.621	0.427	0.160	0.315	-0.032	-0.234	-0.008	0.067	0.151	0.066	0.006	-0.290

RUN NO. 67A 16P 05-10-62 0234-0350 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.037	0.713	0.491	0.168	0.076	0.316	-0.132	0.016	0.126	-0.173	0.526	0.043	-0.153

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.017	0.690	0.490	0.148	0.075	0.318	-0.097	-0.071	0.194	-0.155	0.539	0.084	-0.104

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.955	0.684	0.485	0.138	0.079	0.208	-0.200	-0.075	0.123	-0.136	0.499	-0.018	-0.150

RUN NO. 67A 40P 05-10-62 0234-0350 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.895	0.762	0.534	0.167	0.198	-0.080	-0.071	0.168	0.215	0.243	0.767	0.033	-0.223

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.982	0.704	0.533	0.148	0.209	-0.055	0.025	0.110	0.414	0.279	0.817	0.072	-0.202

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.949	0.696	0.524	0.142	0.215	-0.138	0.060	0.150	0.425	0.256	0.781	-0.033	-0.141

RUN NO. 67B 16P 05-10-62 0404-0520 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.113	0.833	0.544	0.172	0.059	0.225	-0.188	-0.065	0.185	-0.217	0.313	0.295	-0.156

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.090	0.822	0.543	0.144	0.055	0.255	-0.253	-0.038	0.241	-0.227	0.388	0.011	0.023

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.033	0.814	0.534	0.132	0.056	0.227	-0.250	-0.041	0.155	-0.219	0.355	0.055	0.095

RUN NO. 67B 40P 05-10-62 0404-0520 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.062	0.795	0.583	0.158	0.162	-0.169	-0.351	-0.154	0.403	0.101	-0.010	0.157	-0.124

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.039	0.779	0.583	0.146	0.166	-0.126	-0.364	-0.114	0.442	0.099	-0.006	0.247	0.081

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.963	0.770	0.576	0.137	0.177	-0.126	-0.240	-0.106	0.393	0.091	0.028	0.201	0.071

RUN NO. 67C 16P 05-10-62 0533-0649 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.290	0.988	0.649	0.543	-0.001	0.213	-0.240	0.025	0.005	0.005	-0.077	0.347	-0.934

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.251	0.973	0.648	0.063	-0.009	0.174	-0.118	0.013	0.052	-0.025	-0.048	0.566	2.472

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.099	0.942	0.624	0.054	-0.009	0.047	-0.060	0.012	-0.035	0.022	-0.035	0.858	3.172

RUN NO. 67C 40M 05-10-62 0533-0649 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.270	0.990	0.781	0.538	0.028	-0.021	-0.257	0.218	-0.053	-0.076	-0.047	0.438	-0.980

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.240	0.973	0.775	0.057	-0.011	0.058	-0.223	0.169	-0.020	-0.098	-0.093	0.723	1.482

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.131	0.935	0.755	0.047	-0.010	0.047	-0.128	0.093	-0.042	-0.032	-0.050	0.670	1.726

RUN NO. 67D 16M 05-10-62 0704-0820 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.679	1.649	0.712	0.456	-0.074	0.038	-0.026	0.168	-0.127	0.013	0.077	0.255	-0.416

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.513	1.563	0.706	0.237	-0.072	0.105	0.247	0.181	-0.017	-0.024	0.090	0.640	1.787

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.226	1.192	0.695	0.189	-0.080	-0.019	0.275	-0.008	0.414	0.015	0.076	0.570	1.357

RUN NO. 67D 40M 05-10-62 0704-0820 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.592	1.540	0.911	0.465	-0.212	-0.245	-0.231	0.214	-0.299	0.350	0.154	0.474	-0.462

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.434	1.472	0.897	0.217	-0.180	-0.120	-0.063	0.141	-0.061	0.387	0.408	0.699	1.172

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.075	1.167	0.848	0.163	-0.258	-0.141	-0.336	-0.062	0.180	0.262	0.491	0.524	1.430

RUN NO. 67E 16M 05-10-62 0835-0951 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.232	2.512	0.877	0.431	-0.053	-0.019	0.198	0.342	0.449	0.032	0.187	0.417	0.542

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.942	2.285	0.875	0.365	-0.062	0.067	-0.040	-0.149	0.347	0.047	0.120	0.417	0.095

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.515	1.613	0.853	0.303	-0.069	0.147	0.023	0.164	0.586	0.069	0.251	0.366	-0.000

RUN NO. 67E 40M 05-10-62 0835-0951 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.242	2.335	1.143	0.392	-0.092	-0.273	-0.038	0.325	0.465	0.321	0.423	0.441	0.164

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.932	2.101	1.138	0.320	-0.119	-0.256	0.060	-0.150	0.396	0.320	0.368	0.480	-0.050

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.535	1.489	1.082	0.263	-0.162	-0.187	0.335	0.137	0.577	0.317	0.586	0.446	-0.054

RUN NO. 67F 16P 05-10-62 1004-1120 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.825	0.614	0.732	0.376	0.237	0.340	-0.143	-0.045	-0.010	-0.162	0.482	-0.164	0.120

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.864	0.571	0.731	0.367	0.235	0.210	-0.226	0.018	0.172	-0.159	0.464	-0.033	-0.118

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.773	0.565	0.719	0.338	0.251	0.198	-0.063	0.017	0.158	-0.150	0.527	-0.026	0.111

RUN NO. 67F 40P 05-10-62 1004-1120 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.853	0.659	0.863	0.354	0.395	0.070	-0.010	-0.211	0.367	0.152	0.035	0.049	-0.174

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.819	0.627	0.861	0.344	0.409	-0.070	-0.153	-0.007	0.098	0.162	0.049	0.060	-0.166

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.754	0.619	0.847	0.320	0.421	-0.106	-0.146	-0.007	0.072	0.136	0.011	0.002	-0.293

RUN NO. 67G 16P 05-10-62 1143-1259 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.871	2.448	0.867	0.480	-0.079	0.082	-0.227	0.610	0.958	0.105	0.153	0.206	0.076

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.819	2.122	0.966	0.436	-0.076	0.147	-0.146	0.591	1.291	0.115	0.223	0.361	-0.075

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.545	1.514	0.846	0.344	-0.065	0.143	-0.026	0.090	0.289	0.048	0.339	0.318	0.005

RUN NO. 67G 40P 05-10-62 1143-1259 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.023	2.402	1.121	0.441	-0.167	-0.109	-0.460	0.427	0.452	0.300	0.051	0.309	-0.090

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.913	2.088	1.122	0.418	-0.157	-0.003	-0.385	0.592	1.138	0.264	0.120	0.474	-0.278

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.570	1.485	1.084	0.303	-0.153	-0.096	-0.206	0.164	0.345	0.208	0.125	0.416	-0.053

RUN NO. 69A 16P 05-11-62 1150-1318 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.097	1.019	0.284	0.484	0.322	-0.142	-0.330	-0.370	0.395	-0.441	1.497	0.150	-0.980

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.840	0.599	0.262	0.288	0.127	-0.301	0.451	-0.487	1.688	-0.534	1.676	-1.058	3.084

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.581	0.396	0.245	0.144	0.151	-0.154	0.397	0.272	0.302	-0.469	1.297	0.305	5.139

RUN NO. 69A 40M 05-11-62 1150-1318 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.981	0.881	C.326	0.472	1.878	0.150	-0.382	-0.222	0.066	0.209	0.902	0.127	-0.630

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.796	0.509	C.325	0.360	1.569	-0.358	-0.166	0.214	C.291	C.262	0.844	0.609	0.223

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.503	C.378	C.301	0.254	1.864	-0.301	0.316	0.261	0.638	0.114	0.717	0.710	1.453

RUN NO. 69B 16M 05-11-62 1322-1454 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.188	1.062	0.309	0.671	0.096	0.227	-0.197	-0.123	-C.138	0.052	0.767	-1.276	0.125

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.841	0.611	C.293	0.326	0.058	-0.198	0.332	0.227	0.889	-0.252	0.755	-0.577	2.026

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.733	0.455	0.289	0.134	0.055	-0.231	0.894	0.295	0.871	-0.300	1.039	-0.044	4.13J

RUN NO. 69B 40M 05-11-62 1322-1454 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.095	C.724	0.381	0.330	-0.111	-0.013	-0.358	0.546	-0.258	0.493	0.851	-1.421	1.518

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.616	0.505	C.375	0.199	0.103	-C.196	-0.212	0.263	0.566	0.395	0.707	-0.684	2.716

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.521	0.443	C.355	0.113	0.298	-0.299	0.36C	0.099	0.549	0.277	0.815	0.020	3.729

RUN NO. 71A 16M 10-17-62 1936-2048 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.639	0.493	C.271	0.327	0.337	-0.106	-0.166	-0.070	-0.019	-0.049	0.283	0.243	-0.868

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.566	0.427	0.269	0.178	0.289	0.262	-0.103	-0.188	0.245	-0.041	0.254	0.118	0.239

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.538	0.415	0.267	0.170	0.294	0.183	-0.126	-0.166	0.357	-0.056	0.223	-0.037	0.031

RUN NO. 71B 16M 10-17-62 2051-2204 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.784	0.647	C.388	0.229	0.197	0.225	-0.202	-0.116	0.008	-0.270	0.651	0.145	-0.326

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.755	0.587	0.386	0.163	0.173	0.291	-0.160	-0.091	0.020	-0.227	0.718	0.054	-0.007

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.660	0.575	0.377	0.148	0.203	0.213	-0.066	-0.093	-0.002	-0.264	0.792	0.060	0.127

RUN NO. 72A 16M 10-17-62 2251-0006 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.659	0.429	0.286	0.357	0.269	0.213	-0.323	0.058	0.185	-0.114	0.444	0.094	-0.754

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.575	0.413	0.285	0.138	0.196	0.195	-0.085	0.069	0.406	-0.041	0.373	-0.033	-0.139

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.519	0.402	0.277	0.129	0.230	0.163	0.081	0.053	0.354	-0.078	0.395	-0.022	0.083

RUN NO. 72B 16M 10-18-62 0006-0122 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.697	0.524	0.329	0.248	0.197	0.230	-0.072	-0.065	-0.044	-0.086	0.299	0.415	-0.267

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.627	0.497	0.326	0.155	0.179	0.164	0.005	0.007	-0.077	-0.118	0.314	0.140	0.036

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.597	0.489	0.322	0.144	0.183	0.159	0.019	0.022	-0.005	-0.082	0.298	-0.002	0.179

RUN NO. 72C 16M 10-18-62 0122-0238 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.667	0.518	0.278	0.267	0.222	-0.017	-0.116	0.137	0.059	-0.005	0.379	0.234	-0.586

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.587	0.468	0.277	0.149	0.224	0.080	-0.200	0.014	0.229	-0.040	0.445	0.131	0.093

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.534	0.429	0.272	0.143	0.233	0.074	-0.265	0.046	0.059	-0.035	0.425	0.078	-0.022

RUN NO. 72F 16M 10-18-62 0510-0626 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.660	0.426	0.253	0.229	0.310	0.006	-0.168	-0.020	0.410	0.050	0.431	0.240	-0.372

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.543	0.416	0.253	0.160	0.291	0.191	-0.141	-0.039	0.266	0.065	0.459	0.190	-0.090

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.521	0.402	0.253	0.149	0.293	0.150	-0.108	-0.003	0.512	0.035	0.444	0.150	-0.200

RUN NO. 75A 16M 10-24-62 1001-1116 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.275	1.466	0.617	0.453	-0.146	-0.128	-0.164	-0.014	-0.237	0.453	0.241	0.321	0.044

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.166	1.279	0.591	0.324	-0.148	-0.370	-0.128	-0.054	-0.131	0.293	0.163	0.576	0.294

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.960	0.930	0.559	0.252	-0.179	-0.215	0.103	0.055	0.323	0.136	0.002	0.495	0.270

RUN NO. 75B 16M 10-24-62 1117-1233 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.339	1.891	0.670	0.472	-0.106	-0.044	-0.177	0.244	-0.270	0.129	0.141	0.225	-0.430

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.330	1.511	0.669	0.388	-0.103	0.011	-0.234	0.118	0.374	0.125	0.136	0.508	-0.042

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.036	1.045	0.653	0.228	-0.112	-0.128	-0.194	0.111	0.343	0.027	0.201	0.531	1.001

RUN NO. 76A 16M 10-24-62 1451-1606 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.402	1.589	0.613	0.314	-0.012	-0.047	-0.531	-0.323	0.279	0.085	0.493	-0.231	-1.107

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.294	1.285	0.602	0.108	-0.022	-0.117	-0.436	0.142	0.283	0.047	0.377	0.261	0.617

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.992	1.021	0.584	0.070	-0.022	-0.048	0.030	0.105	0.393	0.045	0.359	0.157	1.105

RUN NO. 82E 16M 11-02-62 0916-1025 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.842	0.741	0.443	0.403	-0.395	-0.159	-0.193	0.224	0.437	0.475	0.010	0.344	-0.358

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.729	0.698	0.443	0.274	-0.406	-0.314	0.215	-0.286	0.930	0.439	-0.035	0.585	-0.047

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.616	0.576	0.410	0.229	-0.535	-0.265	0.429	-0.001	0.461	0.333	0.095	0.605	0.304

RUN NO. 82E 40M 11-02-62 0916-1025 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.043	0.615	0.599	0.364	-0.400	-0.380	0.574	0.270	0.424	0.449	-0.309	0.346	-0.410

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.853	0.543	0.602	0.222	-0.414	-0.806	1.745	-0.049	1.076	0.409	-0.368	0.913	0.859

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.687	0.484	0.532	0.177	-0.531	-0.746	2.216	-0.051	0.969	0.320	1.844	0.571	1.003

RUN NO. 84A 16M 11-06-62 1246-1401 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.195	1.259	0.516	0.234	-0.032	0.038	-0.494	0.101	0.151	-0.056	0.228	0.506	-0.969

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.087	1.049	0.509	0.082	-0.031	-0.031	-0.358	0.159	0.003	0.008	0.214	0.080	-0.069

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.830	0.840	0.482	0.056	-0.038	-0.013	-0.163	-0.063	-0.112	-0.028	0.468	-0.016	-0.125

RUN NO. 84A 40M 11-06-62 1246-1401 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.427	1.199	0.705	0.229	-0.060	-0.315	-0.051	0.078	0.162	-0.087	-0.290	0.577	-0.908

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.276	1.014	0.695	0.069	-0.061	-0.525	0.698	0.046	0.475	-0.015	-0.263	0.103	-0.298

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.963	0.776	0.651	0.058	-0.093	-0.435	1.018	-0.202	0.814	-0.044	0.056	0.106	0.588

RUN NO. 84B 10M 11-06-62 1401-1513 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.089	1.281	0.480	0.095	-0.023	0.200	-0.333	-0.124	-0.117	0.012	0.427	-0.417	-0.792

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.895	0.949	0.474	0.044	-0.019	0.136	-0.239	0.006	-0.267	-0.052	1.679	0.092	-0.030

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.557	0.749	0.456	0.030	-0.017	-0.046	-0.056	-0.003	0.271	0.005	0.805	0.067	1.197

RUN NO. 84B 40M 11-06-62 1401-1513 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.224	1.206	0.585	0.092	-0.052	-0.226	-0.060	-0.126	-0.268	0.002	-0.349	-0.132	-0.722

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.008	0.856	0.581	0.046	-0.044	-0.371	0.382	0.089	-0.314	-0.032	-0.250	0.431	0.501

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.778	0.689	0.544	0.031	-0.055	-0.575	1.077	-0.018	0.094	0.068	-0.101	0.480	1.846

RUN NO. 85A 10M 11-16-62 1116-1231 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.348	1.822	0.630	0.549	-0.094	-0.011	-0.279	0.047	-0.357	0.103	0.023	-0.469	-0.623

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.183	1.346	0.627	0.270	-0.100	-0.036	-0.292	0.222	0.271	0.051	0.033	-0.123	-0.441

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.041	1.053	0.607	0.208	-0.106	-0.106	-0.316	0.102	0.604	0.046	0.097	0.005	0.053

RUN NO. 85A 40M 11-16-62 1116-1231 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.540	1.716	0.799	0.446	-0.110	-0.466	0.502	-0.086	-0.455	0.080	-0.602	-0.476	-0.496

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.305	1.279	0.788	0.203	-0.142	-0.641	0.974	0.106	-0.171	0.032	-0.527	0.002	-0.418

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.111	0.995	0.747	0.152	-0.154	-0.584	0.850	0.137	0.300	0.023	-0.280	0.210	-0.068

RUN NO. 85B 16M 11-16-62 1254-1347 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.451	1.550	0.647	0.395	-0.053	0.066	-0.388	0.084	0.107	-0.044	0.076	0.161	-0.748

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.335	1.490	0.649	0.263	-0.047	-0.061	-0.231	0.191	-0.222	-0.111	0.174	0.481	0.184

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.982	1.112	0.627	0.159	-0.053	0.072	0.138	0.187	0.023	-0.012	0.115	0.003	0.239

RUN NO. 85B 40M 11-16-62 1254-1347 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.679	1.357	0.796	0.379	-0.130	-0.502	0.030	-0.127	0.355	-0.011	-0.269	0.129	-0.758

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.513	1.278	0.788	0.212	-0.109	-0.588	-0.178	0.102	-0.056	0.075	-0.271	0.363	-0.220

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.082	0.931	0.749	0.121	-0.131	-0.800	1.078	0.193	0.221	0.072	0.052	0.197	0.701

RUN NO. 85C 16M 11-16-62 1358-1503 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.444	1.403	0.630	0.138	0.001	-0.049	-0.534	0.064	0.260	-0.119	0.418	0.299	0.053

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.268	1.290	0.629	0.114	0.004	-0.050	-0.496	0.124	0.361	-0.056	0.421	-0.080	-0.070

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.102	1.088	0.615	0.088	0.009	0.052	-0.363	0.095	0.091	-0.108	0.347	-0.036	0.846

RUN NO. 85C 40M 11-16-62 1358-1503 EST

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.480	1.307	0.735	0.140	-0.012	-0.490	0.016	-0.094	0.162	0.226	-0.155	0.115	0.164

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.275	1.180	0.733	0.104	-0.009	-0.478	0.079	0.002	0.199	0.285	-0.040	-0.046	-0.317

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.094	1.035	0.713	0.083	-0.005	-0.550	0.465	0.029	0.113	0.223	-0.025	-0.072	0.402

RUN NO 87A 46M 6-14-63 1401-1502(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.021	0.615	0.558	0.416	-0.391	-0.554	0.305	0.096	0.330	0.475	0.056	0.044	-0.909

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.766	0.585	0.513	0.185	-0.262	-0.322	0.616	-0.140	0.263	0.259	0.049	1.244	2.840

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.573	0.530	0.451	0.126	-0.271	-0.424	1.816	-0.026	0.743	0.286	0.577	1.056	4.600

RUN NO 87A 91M 6-14-63 1401-1502(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.904	0.485	0.515	0.343	-0.398	-0.418	-0.249	-0.276	0.531	0.934	1.216	0.674	-0.487

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.552	0.459	0.461	0.156	0.671	-0.960	1.459	-0.501	1.411	1.046	1.605	-0.143	0.927

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.474	0.413	0.425	0.102	1.411	-0.933	2.949	-0.582	1.414	0.665	1.913	0.581	1.061

RUN NO 88A 15M 6-18-63 0936-1052(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.359	0.861	0.656	1.147	-0.160	-0.241	-0.211	-0.030	-0.071	0.331	-0.116	-0.008	-1.066

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.204	0.952	0.654	0.489	-0.145	-0.516	0.159	0.005	-0.160	0.346	-0.051	0.709	0.663

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.946	0.748	0.618	0.316	-0.172	-0.442	0.303	-0.134	0.172	0.314	0.126	0.694	0.939

RUN NO 88A 45M 6-18-63 0936-1052(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.009	0.590	0.452	1.030	-0.409	-0.161	-0.427	-0.231	0.749	0.690	0.791	-0.085	-1.379

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.59.	0.556	0.438	0.249	0.646	-0.695	1.162	-0.183	0.497	0.605	0.804	0.497	0.054

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.475	0.479	0.385	0.152	0.983	-0.431	1.437	-0.355	1.044	0.403	1.062	0.315	0.115

RUN NO 89A 45M 6-18-63 1336-1437(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.065	0.948	0.727	0.288	-0.221	-0.722	1.269	0.189	0.257	0.266	0.013	0.863	0.851

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.044	0.938	0.722	0.210	-0.119	-0.449	-0.067	0.182	0.108	0.283	0.163	0.383	0.042

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.772	0.981	0.631	0.130	0.031	-0.392	0.907	0.085	1.857	0.137	1.126	0.296	0.350

RUN NO 89A 91M 6-18-63 1336-1437(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.214	0.929	0.804	0.270	-0.099	-0.402	-0.226	-0.107	0.138	0.673	0.517	0.963	0.432

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.072	0.909	0.796	0.162	0.030	-0.403	-0.353	-0.176	0.160	0.574	0.394	0.132	-0.391

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.938	0.814	0.727	0.112	0.226	-0.309	0.054	-0.172	0.181	0.352	0.596	0.567	2.032

RUN NO 9CA 15M 6-18-63 1501-1601(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.474	1.102	0.786	0.346	-0.054	-0.053	-0.372	-0.060	0.010	0.044	-0.178	0.227	-0.272

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.406	1.059	0.775	0.280	-0.052	-0.117	-0.418	-0.013	0.052	0.064	-0.141	0.375	-0.152

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.221	0.991	0.745	0.193	-0.052	-0.311	0.089	-0.054	0.116	0.060	0.159	0.394	-0.089

RUN NO 9CA 46M 6-18-63 1501-1601(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.109	0.936	0.698	0.303	0.047	0.069	-0.466	0.271	0.375	-0.051	-0.005	0.569	-0.219

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.039	0.891	0.696	0.183	0.008	-0.084	-0.443	0.174	0.003	-0.062	0.032	-0.015	0.297

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.781	0.810	0.646	0.105	0.154	-0.076	-0.131	0.102	0.297	-0.065	0.022	0.349	1.253

RUN NO 9CB 46M 6-18-63 1615-1714(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.308	0.959	0.705	0.281	-0.015	-0.111	-0.126	0.110	0.175	0.100	-0.037	-0.643	-0.845

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.238	0.931	0.700	0.097	-0.008	-0.137	-0.162	0.075	0.209	0.149	-0.038	0.253	0.268

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.875	0.872	0.658	0.054	0.047	-0.201	0.183	0.110	-0.098	0.043	-0.108	0.406	0.744

RUN NO 9CB 91M 6-18-63 1615-1714(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.469	1.013	0.790	0.262	0.075	-0.418	-0.172	0.024	0.315	0.354	0.442	-0.389	-0.628

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.316	1.000	0.783	0.120	0.102	-0.438	-0.288	0.005	0.375	0.299	0.445	0.819	1.858

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.971	0.954	0.725	0.096	0.203	-0.296	0.379	0.012	0.130	0.286	0.297	0.998	2.773

RUN NO 9CC 15M 6-18-63 1721-1836(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.344	0.994	0.638	0.441	0.036	-0.017	-0.150	-0.092	0.350	0.142	0.288	-0.207	-1.304

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.261	0.986	0.634	0.061	0.007	-0.102	0.079	-0.029	0.369	0.195	0.406	0.366	0.747

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.015	0.937	0.615	0.050	0.009	-0.156	0.167	-0.079	0.227	-0.182	0.307	0.410	0.868

RUN NO 90C 46M 6-18-63 1721-1836(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.146	0.907	0.620	0.365	0.028	-0.063	-0.167	0.023	0.474	-0.020	0.144	-0.172	-1.301

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.066	0.885	0.620	0.071	0.059	-0.045	-0.159	0.085	0.765	-0.031	0.152	0.468	0.730

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.942	0.835	0.612	0.052	0.065	-0.095	-0.119	0.035	0.522	-0.124	0.217	0.872	1.766

RUN NO 90D 46M 6-18-63 1840-1956(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.076	0.972	0.490	0.560	0.137	0.118	-0.524	0.201	-0.022	0.128	0.561	0.773	-0.913

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.989	0.815	0.488	0.079	0.082	-0.219	-0.006	0.063	0.356	0.085	0.625	0.310	0.824

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.745	0.698	0.464	0.052	0.103	-0.172	0.344	0.052	0.609	0.053	0.633	0.338	0.906

RUN NO 90D 91M 6-18-63 1840-1956(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.339	1.000	0.522	0.588	0.475	0.027	-0.564	0.071	-0.386	0.154	0.508	0.657	-1.054

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.936	0.855	0.520	0.145	0.271	-0.443	0.435	-0.098	-0.021	0.184	0.726	0.659	1.291

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.773	0.642	0.493	0.115	0.408	-0.252	0.542	-0.003	0.612	0.118	0.542	0.659	2.229

RUN NO 91A 15M 6-18-63 2150-2300(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.677	0.504	0.319	0.113	0.109	-0.052	-0.052	-0.196	-0.628	0.163	0.695	0.350	-0.408

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.623	0.475	0.316	0.063	0.079	-0.014	0.015	0.025	0.049	0.143	0.527	-0.218	-0.119

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.567	0.453	0.308	0.053	0.090	-0.138	0.217	-0.061	0.200	0.144	0.573	-0.301	0.182

RUN NO 91A 46M 6-18-63 2150-2300(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.470	0.398	0.237	0.111	0.355	-0.341	0.264	0.054	0.802	-0.056	0.997	0.394	0.006

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.435	0.362	0.237	0.077	0.415	-0.428	0.527	0.032	0.784	-0.049	0.980	0.220	0.724

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.339	0.344	0.235	0.065	0.406	-0.338	0.485	0.029	0.745	-0.057	0.898	0.219	0.843

RUN NO 91B 46M 6-18-63 2306-0010(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.447	0.372	0.152	0.137	1.246	-0.366	-0.335	-0.099	-0.004	0.206	1.224	-0.089	-0.108

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.317	0.297	0.151	0.082	0.862	-0.375	0.360	-0.224	0.339	0.222	1.320	0.406	1.371

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.296	0.252	0.148	0.068	0.866	-0.403	0.667	-0.326	0.984	0.202	1.146	0.079	1.392

RUN NO 91B 91M 6-18-63 2306-0010(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.449	0.271	0.072	0.142	0.541	-0.538	0.048	0.404	-0.222	-0.645	1.652	-0.461	0.013

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.202	0.199	0.069	0.102	-47.875	-0.295	0.654	-0.038	-0.015	-0.387	2.411	-0.559	0.963

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.118	0.114	0.058	0.048	7.654	-0.433	2.933	-0.165	1.722	-0.322	2.884	0.537	2.416

RUN NO 92A 15M 6-19-63 0030-0146(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.122	0.910	0.378	0.072	0.019	0.042	-0.692	-0.085	-0.451	0.007	0.691	0.300	-0.118

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.738	0.568	0.373	0.056	0.041	-0.102	0.152	-0.032	-0.065	0.172	-0.682	0.149	-0.082

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.652	0.500	0.361	0.043	0.042	-0.203	0.265	-0.020	0.322	0.160	0.954	-0.046	0.314

RUN NO 92A 46M 6-19-63 0030-0146(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.908	0.835	0.223	0.142	0.244	-0.534	-0.475	0.279	-1.051	0.184	0.872	0.606	0.844

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.478	0.394	0.220	0.109	0.483	-0.169	0.145	0.124	0.510	0.242	0.882	0.664	1.168

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.393	0.317	0.212	0.081	0.507	-0.416	0.760	-0.061	1.145	0.234	0.986	0.269	1.289

RUN NO 94A 46M 6-19-63 1306-1422(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.217	0.930	0.785	0.432	-0.159	-0.407	0.281	-0.122	-0.013	-0.075	-0.418	-0.401	0.154

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.186	0.856	0.779	0.295	-0.182	-0.580	0.556	-0.045	-0.017	-0.132	-0.407	1.090	1.279

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.340	0.818	0.668	0.187	-0.170	-0.401	1.135	0.014	-0.016	-0.109	-0.158	0.473	0.980

RUN NO 94A 91M 6-19-63 1306-1422(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.106	0.870	0.754	0.320	0.076	-0.431	0.272	0.094	-0.336	0.291	0.103	-0.442	0.105

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.041	0.812	0.749	0.198	0.054	-0.528	0.335	0.150	-0.097	0.235	0.078	0.839	0.988

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.862	0.760	0.711	0.153	0.161	-0.385	0.723	0.162	-0.043	0.106	0.155	1.014	3.188

RUN NO 95A 15M 6-19-63 1446-1602(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.421	1.031	0.723	0.401	-0.069	-0.156	-0.335	0.023	0.180	0.273	-0.194	-0.121	0.033

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.404	0.970	0.719	0.366	-0.082	-0.224	-0.261	-0.038	0.015	0.238	-0.219	0.409	-0.472

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.085	0.866	0.677	0.214	-0.090	-0.262	0.047	0.077	0.168	0.247	-0.026	0.448	-0.181

RUN NO 95A 45M 6-19-63 1446-1602(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.182	0.971	0.761	0.316	-0.038	-0.495	0.271	0.115	-0.204	0.144	-0.230	-0.237	-0.016

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.184	0.859	0.721	0.229	-0.121	-0.286	-0.178	-0.013	-0.098	0.104	-0.225	0.422	-0.132

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.774	0.782	0.641	0.119	0.021	-0.199	1.016	-0.028	-0.031	-0.017	0.164	0.407	1.338

RUN NO 96A 00M 6-19-63 1621-1737(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.980	0.774	0.574	0.188	-0.050	-0.477	0.101	-0.208	0.171	0.233	-0.209	0.078	-0.010

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.954	0.719	0.568	0.121	-0.099	-0.479	0.306	-0.317	0.450	0.168	-0.196	0.362	0.071

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.617	0.628	0.474	0.066	-0.004	-0.415	1.080	-0.184	0.487	-0.071	0.239	0.470	1.916

RUN NO 96A 91M 6-19-63 1621-1737(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.917	0.698	0.459	0.252	-0.114	-0.639	-0.071	0.002	0.053	0.552	1.318	0.300	-0.747

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.725	0.580	0.457	0.094	-0.139	-0.789	0.801	-0.209	0.549	0.499	1.449	0.995	1.629

AFTER A 101 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.469	0.468	0.416	0.052	0.051	-0.325	0.603	-0.127	0.501	0.402	1.470	1.112	4.453

RUN NO 96B 46M 6-19-63 1751-1907(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.939	0.726	0.518	0.178	-0.030	-0.416	-0.210	-0.233	0.193	0.234	0.416	0.158	-1.236

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.907	0.668	0.512	0.031	-0.002	-0.373	-0.116	-0.103	0.177	0.185	0.351	-0.028	1.291

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.716	C.542	C.488	0.024	0.006	-0.149	0.015	-0.078	0.302	0.071	0.432	0.263	0.865

RUN NO 96B 91M 6-19-63 1751-1907(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.727	0.483	0.293	0.069	0.124	-0.592	0.726	0.191	0.566	0.842	3.588	-C.369	-0.787

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.487	0.384	0.291	0.036	0.125	-0.812	1.541	-0.132	1.528	0.895	4.117	0.086	0.299

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.383	0.334	0.278	0.024	0.146	-0.596	1.334	0.037	2.006	0.637	3.027	0.025	2.412

RUN NO 96C 46M 6-19-63 1921-2037(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.822	0.564	C.365	0.065	0.096	-0.199	-0.490	0.064	0.223	C.095	0.347	-0.057	-0.464

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.687	0.526	0.364	0.054	0.108	-0.162	-0.247	0.055	0.359	0.145	-0.426	-0.288	-0.052

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.593	0.493	0.346	0.045	0.108	-C.051	-0.139	0.084	0.309	0.059	0.352	-0.165	0.047

RUN NO 96C 91M 6-19-63 1921-2037(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.776	0.396	0.271	0.101	0.279	-0.227	-0.704	-0.097	C.350	0.129	1.041	-0.270	-0.526

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.438	0.361	0.268	0.047	0.352	-0.106	0.153	0.021	0.481	0.184	1.040	-0.233	0.241

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
C.404	0.330	0.258	0.041	0.331	-0.185	0.211	0.047	C.619	0.185	0.887	-0.294	0.373

RUN NO 97 15M 7-3-63 1446-1600(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.625	1.245	C.665	0.462	-0.018	-C.094	-0.371	0.108	0.271	0.061	0.371	0.901	-0.011

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.592	1.212	C.666	0.308	-0.028	-0.009	-0.278	0.072	0.428	0.005	0.325	0.512	0.921

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.157	C.949	0.642	0.131	-0.019	-0.296	0.335	0.227	C.386	C.035	0.427	0.184	0.789

RUN NO 97 46M 7-3-63 1446-1600(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.587	1.401	0.762	0.324	-0.075	-0.541	-0.351	-0.153	0.054	0.200	-0.034	0.590	-0.373

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.410	1.331	0.762	0.186	-0.074	-0.346	-0.007	-0.067	-0.042	0.188	0.123	0.862	1.833

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.950	0.916	0.693	0.100	-0.034	-0.372	0.441	0.086	0.433	0.203	0.205	-0.257	2.106

RUN NO 98 46M 7-3-63 1631-1727(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.516	1.459	0.326	0.333	-0.005	-0.486	0.638	0.127	0.071	0.065	0.268	0.140	-1.179

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.490	1.419	0.822	0.067	-0.000	-0.291	-0.233	0.042	-0.078	0.020	0.274	-0.586	1.148

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.110	1.249	0.777	0.049	0.006	-0.311	0.118	0.046	-0.082	0.079	0.188	-0.778	3.381

RUN NO 98 91M 7-3-63 1631-1727(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.233	1.171	0.806	0.341	-0.018	-0.319	-0.213	-0.028	-0.034	0.126	0.280	0.140	-1.338

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.240	1.124	0.804	0.066	-0.029	-0.400	-0.297	0.046	0.094	0.132	0.258	-0.324	4.090

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.868	0.975	0.756	0.041	-0.017	-0.151	-0.153	0.046	0.192	0.024	0.401	-1.514	8.263

RUN NO 99A 15M 7-3-63 1807-1923(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.736	1.147	0.696	0.597	0.002	0.573	0.311	0.137	0.434	-0.117	0.307	0.363	-1.140

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.589	1.078	0.693	0.058	0.008	0.442	0.491	0.268	0.859	-0.147	0.344	-0.332	0.592

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.269	1.005	0.670	0.045	0.012	0.101	0.434	0.210	0.618	-0.124	0.487	-0.508	1.231

RUN NO 99A 46M 7-3-63 1807-1923(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.824	1.369	0.827	0.546	0.016	0.262	1.689	0.076	0.356	0.014	0.537	0.320	-0.011

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.621	1.213	0.822	0.067	0.035	-0.081	0.081	0.163	0.826	0.022	0.515	0.044	0.118

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.136	1.140	0.765	0.054	0.057	-0.200	-0.062	0.092	0.742	0.180	0.511	-0.051	0.178

RUN NO 1C0A 15M 7-3-63 2124-2224(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.154	0.747	0.513	0.391	0.014	0.297	0.034	-0.230	0.469	-0.175	0.213	0.341	-0.993

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.053	0.714	0.513	0.084	0.017	0.19'	-0.037	-0.352	0.774	-0.083	0.160	0.161	0.209

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.857	0.667	0.487	0.057	0.017	0.070	0.226	-0.113	0.680	-0.111	0.331	-0.004	0.156

RUN NO 1C0A 46M 7-3-63 2124-2224(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.144	1.072	0.641	0.343	0.144	0.034	-0.040	-0.051	0.376	0.156	0.590	0.141	-0.954

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.127	0.972	0.641	0.105	0.117	0.021	0.120	-0.074	1.164	0.169	0.661	0.182	4.185

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.908	0.926	0.624	0.086	0.127	-0.008	0.156	-0.031	0.509	0.077	0.472	0.069	0.071

RUN NO 1C0B 46M 7-3-63 2235-2335(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.242	0.994	0.646	0.185	0.124	-0.177	-0.204	0.118	0.049	0.246	0.645	-0.285	-0.344

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.211	0.969	0.645	0.132	0.120	-0.180	-0.061	0.073	0.113	0.205	0.540	0.183	-0.150

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.965	0.927	0.626	0.106	0.142	-0.356	0.309	-0.026	0.038	0.219	0.704	0.100	-0.116

RUN NO 1C0B 91M 7-3-63 2235-2335(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.108	0.870	0.587	0.167	0.273	0.068	-0.448	0.088	0.002	0.126	0.616	-0.322	-0.365

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.092	0.808	0.586	0.121	0.288	-0.004	-0.246	0.005	0.203	0.053	0.334	-0.123	-0.411

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.816	0.774	0.560	0.099	0.392	-0.049	0.063	-0.042	0.117	0.061	0.755	-0.151	0.008

RUN NO 1C1A 15M 7-4-63 0814-0930(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.738	1.608	0.806	0.793	-0.039	-0.030	-0.042	0.201	-0.028	0.095	0.481	0.125	-0.930

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.692	1.552	0.803	0.384	-0.024	-0.053	-0.175	0.122	-0.034	0.067	0.467	0.284	-0.116

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.288	1.048	0.776	0.202	-0.019	-0.217	0.052	0.281	0.522	0.083	0.521	0.279	0.326

RUN NO 1C1A 46M 7-4-63 0814-0930(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.680	1.774	0.949	0.531	-0.132	-0.590	0.623	0.065	-0.387	0.560	0.469	0.394	-0.976

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.575	1.668	0.925	0.243	-0.082	-0.488	0.281	-0.020	-0.360	0.453	0.189	-0.118	0.674

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.070	1.076	0.799	0.133	-0.057	-0.557	1.295	0.185	0.348	0.162	0.304	0.415	2.832

RUN NO 1C1B 46M 7-4-63 0944-1100(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.588	1.850	0.858	0.549	-0.073	-0.379	-0.204	0.139	-0.102	0.279	0.261	0.435	-0.700

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.520	1.514	0.853	0.283	-0.053	-0.428	0.201	-0.077	-0.027	0.273	0.374	0.297	0.198

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.972	1.119	0.775	0.141	-0.012	-0.482	0.637	0.119	0.088	0.166	0.317	-0.205	1.169

RUN NO 1C1B 91M 7-4-63 0944-1100(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.492	1.704	0.917	0.597	0.116	-0.417	-0.027	0.302	0.104	0.096	0.271	0.234	-0.946

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.378	1.467	0.908	0.338	0.148	-0.396	0.162	-0.092	-0.100	0.226	0.300	0.399	-0.570

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.805	0.983	0.805	0.148	0.892	-0.417	1.029	0.135	0.807	0.019	0.257	-0.351	2.757

RUN NO 1C1C 15M 7-4-63 1122-1238(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.797	1.684	0.889	0.333	0.003	0.061	-0.176	0.013	0.053	-0.076	-0.018	0.602	0.234

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.741	1.522	0.686	0.226	-0.000	0.087	-0.365	0.089	0.428	-0.035	-0.071	0.480	1.323

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.391	1.207	0.847	0.122	-0.002	0.017	-0.027	0.058	0.239	-0.098	0.053	0.152	2.324

RUN NO 1C1C 46M 7-4-63 1122-1238(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.714	1.939	0.950	0.245	-0.003	-0.520	0.159	0.157	-0.249	0.405	0.273	0.460	0.628

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.570	1.597	0.940	0.189	-0.020	-0.513	2.151	0.246	0.307	0.404	0.406	0.080	2.599

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.173	1.197	0.882	0.101	-0.034	-0.405	0.917	0.100	0.351	0.236	0.527	0.307	2.076

RUN NO 102A 46M 7-4-63 1307-1423(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.179	2.074	0.986	0.527	-0.057	-0.245	-0.440	-0.189	0.162	0.239	-0.087	0.366	-0.840

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.032	1.580	0.980	0.241	-0.038	-0.274	-0.328	0.115	-0.064	0.290	-0.118	1.026	1.426

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.329	1.238	0.893	0.132	-0.042	-0.362	0.716	-0.015	0.272	0.157	0.039	-0.203	1.896

RUN NO 102A 91M 7-4-63 1307-1423(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
2.206	1.925	1.042	0.571	-0.188	-0.460	0.182	-0.341	0.348	0.171	0.006	0.607	-0.440

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.867	1.448	1.031	0.308	-0.083	-0.560	0.749	0.089	-0.062	0.049	0.037	0.618	0.124

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.024	1.070	0.973	0.163	-0.062	-0.247	0.729	-0.048	0.155	0.060	0.212	0.119	1.941

RUN NO 103A 13M 7-4-63 1504-1620(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.934	1.793	0.836	0.289	-0.010	0.235	-0.290	-0.250	0.085	-0.263	0.182	-0.081	-0.

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.876	1.754	0.833	0.255	-0.010	0.190	-0.208	-0.024	-0.054	-0.228	0.056	0.104	-0.417

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.413	1.202	0.806	0.127	-0.003	-0.042	-0.004	0.179	0.418	-0.173	0.157	0.212	0.486

RUN NO 103A 46M 7-4-63 1504-1620(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.908	1.999	0.981	0.211	-0.040	-0.214	-0.383	-0.350	-0.194	0.326	-0.011	-0.386	0.041

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.826	1.929	0.974	0.192	-0.045	-0.127	-0.203	-0.139	-0.426	0.300	-0.044	-0.082	-0.339

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.250	1.327	0.897	0.132	-0.049	-0.352	0.313	-0.017	-0.019	0.226	0.098	0.060	-0.043

RUN NO 103B 46M 7-4-63 1637-1753(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.659	1.329	0.787	0.106	-0.007	0.168	-0.384	0.436	0.595	0.333	0.567	-0.744	0.540

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.332	1.305	0.784	0.088	-0.003	-0.111	0.074	0.321	0.406	0.299	0.410	-1.069	1.791

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.930	1.040	0.713	0.065	-0.008	-0.433	1.294	0.144	0.550	0.211	0.955	-0.922	2.357

RUN NO 1C3B 91M 7-4-63 1637-1753(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.624	1.291	0.850	0.123	-0.010	0.116	-0.605	0.351	0.369	0.059	0.077	-0.896	0.959

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.310	1.251	0.845	0.103	-0.007	-0.168	-0.441	0.195	0.355	0.086	-0.016	-0.944	3.000

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.830	1.054	0.747	0.067	0.106	-0.182	0.370	0.039	0.733	0.010	0.517	-1.379	5.467

RUN NO 1C4 46M 7-4-63 2030-2126(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.443	0.494	0.194	0.326	0.454	-0.432	0.137	0.274	-0.299	0.350	2.263	0.617	-0.650

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.386	0.353	0.192	0.159	0.974	-0.263	0.358	0.215	0.849	0.490	2.503	-0.166	-0.105

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.354	0.292	0.189	0.118	0.968	-0.048	0.742	0.078	1.194	0.458	2.594	-0.085	0.674

RUN NO 1C4 91M 7-4-63 2030-2126(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.800	0.525	0.095	0.107	15.110	-0.186	-0.754	-0.695	-0.152	-0.641	2.538	-0.481	0.313

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.211	0.348	0.093	0.070	7.181	0.456	0.383	-0.607	0.980	-0.758	2.001	-0.190	0.802

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.104	0.153	0.087	0.032	3.423	0.638	4.967	0.668	3.722	-0.988	6.063	-0.129	5.097

RUN NO 1C5 46M 7-5-63 0932-1022(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.305	1.197	0.830	0.372	-0.046	-0.275	-0.385	-0.055	-0.018	0.475	0.119	0.538	0.180

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.261	1.082	0.826	0.295	-0.044	-0.329	-0.194	-0.225	-0.193	0.430	-0.022	0.124	-0.312

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.923	0.831	0.710	0.109	-0.030	-0.362	0.202	-0.180	0.252	0.144	0.055	0.450	0.875

RUN NO 1C5 91M 7-5-63 0932-1022(EST)

BEFORE A RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.263	0.958	0.861	0.359	-0.214	-0.536	0.274	0.315	0.179	0.618	0.304	0.716	1.190

AFTER A 601 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
1.209	0.907	0.843	0.266	-0.102	-0.674	0.714	0.052	0.253	0.659	0.475	0.698	0.953

AFTER A 61 POINT RUNNING MEAN

SDU	SDV	SDW	SDT	Z/L	SKU	KTU	SKV	KTV	SKW	KTW	SKT	KTT
0.779	0.675	0.652	0.141	0.283	-0.580	1.802	0.115	0.611	0.309	0.268	0.494	1.206

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13. ABSTRACT

Practical problems dealing with atmospheric turbulence can be simplified by relating fluctuation values to a Gaussian distribution. This is very useful, since it specifies characteristics of the eddy velocity distributions. Fragmentary studies have given some evidence to support the Gaussian hypothesis, but to our knowledge this is the first attempt to examine the distributions of the fluctuation components for a large data sample (135 one-hour runs).

The purpose of the study is to determine the deviations of the observed distribution from a normal distribution and to attempt to determine if these departures can be related to atmospheric stability surface roughness, and height above the surface. In addition, each sample was tested to determine the probability of its coming from a normal distribution. Results are in general agreement with previous investigations. Low frequency trends over hour periods tend to increase the departures from a normal distribution. Treating the probability distributions of the wind components as being normally distributed appears justified over moderate ranges of stability (z/L between -.300 and +.300).

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14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Frequency Distribution Internal Boundary Layer Eddy Velocities Turbulent Components Skewness Kurtosis Stability						

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