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1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE	3. REPORT TYPE AND DATES COVERED FINAL 15 Dec 87 to 14 Dec 90	
4. TITLE AND SUBTITLE STUDY OF VARIOUS PROBLEMS IN STATISTICAL PLANNING			5. FUNDING NUMBERS AFOSR-88-0092 61102F 2304/A5	
6. AUTHOR(S) SUBIR GHOSH				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) UNIVERSITY OF CALIFORNIA, RIVERSIDE THE REGENTS OF THE UNIVERSITY OF CALIFORNIA RIVERSIDE, CA 92521			8. PERFORMING ORGANIZATION REPORT NUMBER 01 0547 AFOSR-TR	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) AFOSR/WH Bldg 410 Bolling AFB DC 20332-8448			10. SPONSORING / MONITORING AGENCY REPORT NUMBER AFOSR-88-0092	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution unlimited.			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words)  The research done under the Grant AFOSR-88-0092 during the period December 1989-December 1990 are (1) efficiency of connected binary block design when a single observation is unavailable (2) determination of optimal experimental conditions using dispersion main effects and interactions of factors in replicated factorial experiments (3) main effect plans with an additional search property for 2 <sup>m</sup> factorial experiments.				
14. SUBJECT TERMS			15. NUMBER OF PAGES	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UL	

Annual Report

Project Title: Study on Various Problems In Statistical Planning

Principal Investigator: Subir Ghosh

Period: December 1989 - December 1990

Grant No.: AFOSR-88-0092

Program Manager: Dr. Jon A. Sjogren  
Department of Mathematics  
and Information Sciences  
Air Force Office Of Scientific Research  
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DC 20332-6448

AFOSR-88-0092  
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A-1



91-04534

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## Annual Report

### **0 Summary**

The research done under the Grant AFOSR-88-0092 during the period December 1989-December 1990 are (1) efficiency of connected binary block design when a single observation is unavailable (2) determination of optimal experimental conditions using dispersion main effects and interactions of factors in replicated factorial experiments (3) main effect plans with an additional search property for  $2^m$  factorial experiments.

### **1 Research Done**

#### **1.1 Efficiency of connected binary block designs when a single observation is unavailable.**

Please see enclosed Technical Report No. 182.

#### **1.2 Determination of optimum experimental conditions using dispersion main effects and interactions of factors in replicated factorial experiments.**

Please see enclosed Technical Report No. 183.

#### **1.3 Main effect plans with an additional search property for $2^m$ factorial experiments.**

Please see enclosed Technical Report No. 184.

## 2 Publication

We present the list of published, accepted and submitted papers during the period December 1989-December 1990 under the AFOSR grant.

### Published

1. Ghosh, S. and Namini, H. (1990). Influential observations under robust designs. Proceedings of coding Theory and Design Theory, Part II (Design Theory). The IMA volumes in mathematics and its applications, Vol. 21, pp. 86-97. Springer-Verlag. New York.
2. Ghosh, S. and Lagergren, E. (1990). Measuring dispersion effects of factors in factorial experiments. Statistical Design and Analysis Of Industrial Experiments, Ch. 16, pp. 459-478. Marcel Dekker, Inc.
3. Ghosh, S. and Lagergren, E. S. (1990). Dispersion models and estimation of dispersion effects in replicated factorial experiments. *J. Statist. Planning and Inference*, Vol. 26, No. 3, 253-262.

### Submitted

1. Ghosh, S., Kageyama, S. and Mukherjee, R. (1990). Efficiency of connected binary block designs when a single observation is unavailable. 17 manuscript pages. *Annals Of Institute Of Statistical Mathematics*.
2. Ghosh, S. and Duh, Y-J. (1990). Determination of optimum experimental conditions using dispersion main effects and interactions of factors in replicated factorial experiments. 15 manuscript pages. *Journal Of Applied Statistics*.

3. Ghosh, S. and Talebi, H. (1990). Main effect plans with an additional search property for  $2^m$  factorial experiments. 27 manuscript pages. *J. of Statist. Planning and Inference*.

### **3 Conferences**

#### **3.1 Invited**

Presented two invited talks at the International Workshops on Linear Models, Experimental Designs and Matrix Theory, August 6-8, 1990, Tampere, Finland.

#### **3.2 Presenting Contributed**

Presented a contributed paper at the 2nd World Congress of the Bernoulli Society and 53rd Annual meeting of the Institute of Mathematical Statistics, Uppsala, Sweden, August 13-18, 1990.

### **4 Interactions**

#### **4.1 Students**

Two students Mr. Hooshang Talebi and Mrs Yi-Jing Duh have completed their Ph.D work under my direction.

#### **4.2 Edited**

I have edited a book "Statistical design and analysis of industrial experiments", Subir Ghosh editor, Marcel Dekker, Inc., New York (1990). Twenty-five researchers (including myself) from academia and industries have contributed to the book.