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ABSTRACTS PERTAINING TO COMMUNIST CHINA IN SOVIET ABSTRACTS JOURNALS

No. 48

(Electrical and Power Engineering Series)

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This serial publication contains translations of abstracts pertaining to Communist China published in Referativnyy Zhurnal, Elektrotekhnika i Energetika (Soviet Abstracts Journal, Electrical and Power Engineering Series), Nos. 17, 20, 21 and 22, 1962.

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RZh Elektrotekhnika i Energetika 17-62

Abst #17D187

Electrical and Power Engineering/ Thermal Power Engineering/ Solar Power Engineering

KO Hsin-shih

"Investigation of Radiation Characteristics of Some Selective Surfaces"

Teploenergetika (Thermal Power Engineering), No 4, 1962, pp 90-92

The results of experimental investigations of the radiation characteristics of selective radiation absorbing surfaces are given. The samples consisted of smoothly polished metal possessing a great reflecting capacity particularly for heat radiation, on which a film was placed. As a standard of a black body carbon black was used in the experiments and was placed on a dull, rough steel plate. Measurements were made at a temperature of ~ 100° C. In determining the coefficient of absorption of solar energy an instrument was used which was mounted on a heliostat which automatically followed the

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visible motion of the sun. The coefficient of absorption A and of emission of radiation ε increase with an increase of the thickness of the film, with ε growing considerably faster. Bibl. 10 titles.
See also RZh E, 1962 13D223 -- R. Koval'skiy.

RZh Elektrotekhnika i Energetika 20-62

Abst#20E13 Electrical Engineering and Power Engineering/ Water Power Engineering and Wind Engineering

CHOU, Chih-hao

Problem of the Economic Determination of a "Reduced" Provision in Water Power Engineering and Irrigation

Izvestiya vysshikh uchebnykh zavedeniy. Energetika [News of Higher Educational Institutions. Power Engineering] 1962, No 2, pp 97-101

The method is expounded to obtain a "reduced" provision for a power controlled irrigation complex. Its basis is the economical demand for a minimum of labor expenditure. In order to compute the provision for irrigation one presumes the maximum general efficiency of the exploitation of the supplying source to obtain a definite guaranteed yield in years of drought. The equation is solved graphically. It is illustrated by an example. The determination of a computed provision for the irrigation systems expounded is sufficiently high. The

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Abst#20E13 (cont'd)

"reduced" provision is determined by the minimum of the curve which represents the relation of the additional summary to the computed expenditures and the provision. Bibl. 8 titles.-- T. Zolotarev.

RZh Elektrotekhnika i Energetika 21-62 | Abst #21L88 | Electrical and Power Engineering/ Electric Equipment in Transportation/ Electric Equipment in Airplanes

BORISOV, K. N.
CHANG Kuan-jen

"Setting-Up the Characteristics of a Direct Current Motor with a Choke Rotating Speed Control"

Trudy Moskovskogo aviatsionnogo instituta (Transactions of the Moscow Aviation Institute), No 145, 1962, pp 41-45

A graphic method for determining the characteristics of a direct current motor is discussed which will permit a visual presentation and a correct selection of the operation of a magnetized choke in regulating the speed of rotation. In analyzing such a system one utilizes the well known family of curves for a choke which express the function $U_{ch} = f(I_{-}) = \varphi(I_{ch})$ at $I_{ch} = \text{const}$ with a superimposed

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Abst #2_L88 (cont'd)

ellipse $-U_{ch} = f_1(I_{ch})$ at different currents of control (see sketch). Assuming that the motor has only an active and the choke an inductive resistance, the basic equation of the curve of constant motor speed (n = const) is obtained:

$$\left(\frac{U_{ch}}{U_{net}}\right)^2 + \left(\frac{\frac{c}{r_m} + I_m}{K_L \frac{U_{net}}{r_m}}\right)^2 = 1,$$

where U_{ch} is the phase voltage at the choke, U_{net} the phase voltage of the network, C the counter electromotive force of the motor at n = const, r_m the internal resistance of the rotor, I_m rotor current, $K_L = \frac{U_{net}}{U_a}$ the coefficient of reduction, U_{ch} the motor voltage, U_a the active voltage reduction, I_{ch} the current in the choke winding. The obtained equation is one of an ellipse and establishes relations among all the basic parameters. The semi-axes of the ellipse are correspondingly equal to U_{net} and $K_L \frac{U_{net}}{r_m}$ (see sketch) and do not depend upon the speed of rotation of the motor. The numerator of the second member of the equation $\frac{c}{r_m} + I_m$ shows that the ellipse is in a general case unsymmetrical in regard to the axis of ordinates. The asymmetry depends upon the rotary speed of the motor. The ellipse

Abst #21L88 (cont'd)

is symmetrical only at n = 0 (curve 1). At other values of n = const the ellipse has the former semi-axes but extends to the left of the initial position (curve 2). At U_{ch} and n = n_0 (ideal idle run of the motor) $I_m = 0$, and the whole ellipse is left of the ordinate axis touching it at the point of origin of coordinates (curve 3). The difference of the currents $I_{m.} - I_m = \frac{}{r_m}$ gives a section of the semi-axis of the ellipse lying left of the ordinate axis. This section is proportional to speed n which makes it possible to use the current axis of the ellipse as a scale for speed. For the practical construction of the motor's characteristics a model is made according to the above indicated formula at n = 0 at a scale of the curve family (see sketch, curve 1). On the horizontal (current) axis one plots at a scale of the rotary speed a uniform scale from n = 0 to n = n_0. In determining the rotary speed of the motor at any point the model is placed on the curve family shown in the sketch and by moving it left or right on the axis of the abscissas up to the intersection with the sought for point, one finds at the intersection of the axis of ordinates with the ellipse the rotary speed of the motor at this point. In using such a model it is possible to construct the

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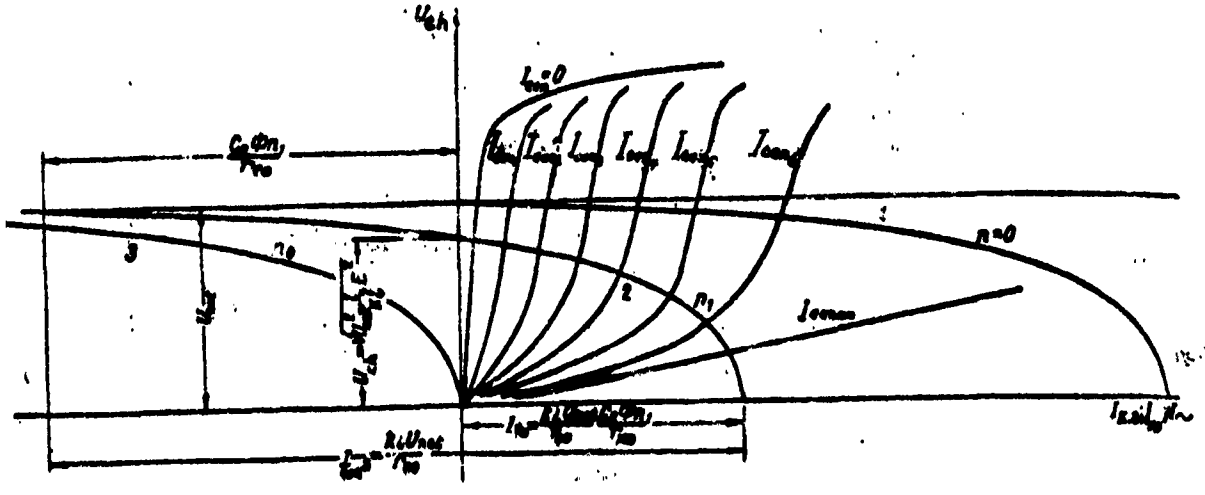
Abst #21L88 (cont'd)



characteristics $I_m = \varphi(I_{ch})$ at n = const on the basis of which it is possible to construct the characteristics $n = f(I_{ch})$ at I_m = const.

Abst #21L88 (cont'd)

If it is necessary to account for the valve resistance and for the active choke resistance, then in constructing the ellipse, one has to take instead of 4 a resistance that equals the sum of all resistances reduced to the rotor.6 ill.--K. Lebedeva.

Key to subscripts in text: ch = choke
re = rotor
con = control
net = network
i = inductive

RZh Elektronika i Energetika 22-62

Abst#22F174 Electrical engineering and Power Engineering/High Voltage Technology

T'AN Tso-wu

Use of Metallic Thermoresistances for Self-Generated Overvoltage Protection

Elektroenergetika (Electrical Power Engineering) No. 5, 1962, pp 67-73

In order to restrict self-generated overvoltage to a value of 2.5 U_f in lines of 400-500 kilovolt one employs surge diverters with semi-conductive "tervite" resistance (decreasing with temperature increase) and magnetic quenching of the arc. For that purpose it is expedient to have the operative resistance made of material with a positive temperature coefficient. At the beginning, as long as the thermal resistance has not reached a high temperature, the value of its resistance remains low, thus securing a low follow voltage. At the end of the disconnection process the thermal resistance reaches a high temperature thereby increasing its resistance that decreases the arising voltage. This fact permits the surge diverter with thermal resistance to protect a lower insulation level than a surge diverter with a nonlinear "tervite"

Abst#22F174 (cont'd)

resistance or with a linear metallic resistance. Investigations have demonstrated that it is worthy of attention to employ in surge diverters thermal resistances as operative resistance. 5 ill, bibliography 4 items

P. Yurikov

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