

ABSTRACTS

DEPARTMENT OF ELECTRICAL COMMUNICATION ENGINEERING

1. **Some Investigations at Microwave Frequencies.** S. K. Chatterjee, *Journal of the Institution of Telecommunication Engineers*, 3 (2), 67-86.

A brief review of the investigations at 3 cm. wavelength, carried out so far at the Indian Institute of Science, is presented. The work includes theoretical investigations on the circuit aspects of microwave cavities, perturbation effects in a cavity resonator and interaction of modes. The paper also presents a report on the results of investigations on the propagation characteristics of microwaves through a cylindrical metallic guide filled completely with two concentric dielectrics. A method of calculating the attenuation and phase constant of a hybrid (EH)₁₁ mode propagating through an imperfectly conducting guide filled with an imperfect dielectric is also discussed. A new method for the determination of conductivity of metals at microwave frequencies is outlined. A survey of the theoretical investigations on a parallel metal plate dielectric and their experimental verifications with the help of a microwave interferometer constructed for the purpose is also given. The paper concludes with a discussion of theoretical and experimental investigations on the radial field spread, in the case of propagation of microwaves on a single wire.

DEPARTMENT OF AERONAUTICAL ENGINEERING

ABSTRACTS OF PAPERS PUBLISHED OUTSIDE

1. **The Suitability of Araldite 'D' Resin in Photoelastic Investigation.** C. L. Amba Rao, *British Journ. of Applied Physics*, 1956, 7, 128.

The results of the investigation of the mechanical and stress optical properties of Araldite D with different concentrations of hardener are presented in this note.

2. **Note on Photoelastic Study of Swept Wings.** C. L. Amba Rao, *Journ. of the Aero. Sciences*, 1956, 23, 589.

Swept wings of high speed aircraft under certain conditions of loading reduce to the case of bending of a thin plate. Usually, the optical birefringence due to the compressive stress cancels that due to the tensile stress in the double layer sandwich plate of the transmitting type. In all the work done so far, the Young's modulus of the photoelastically sensitive plastic is the same as that of the Lucrinite plastic. An expression is derived from fundamentals for a case when the Young's moduli of the plastics are different.

DEPARTMENT OF POWER ENGINEERING

SECTION OF ELECTRICAL ENGINEERING

1. A.C. NETWORK ANALYSER STUDIES AND INTERPRETATION OF RESULTS OBTAINED. B. N. Narayana Iyengar, Assistant Professor in Electrical Engineering, *Indian Power Engineering*, 4, No. 3.

The paper which is the result of the author's experience as a participant in a number of network analyser studies of the power systems in India during the last few years gives an idea of the relative importance of the types of system studies made on the network analyser and of how a close study of the results obtained give a clear insight into and better appreciation of the problems encountered in power system design and operation as well as their solutions.

2. SWITCHING TRANSIENTS IN SINGLE-PHASE INDUCTION MOTORS. F. Venkata Rao, Lecturer in Electrical Engineering, *A.I.E.E. Transactions Paper*, No. 36-317.

The subject of transients in polyphase induction motors and synchronous machines has been studied in very great detail by several investigators in the past, but no published literature exists dealing exclusively with the analysis of the problem of transients in single-phase induction motors. This particular problem has been studied in this paper by applying the Laplace Transform. The results of actual computation of its currents and developed electrical torque are compared with the data obtained by setting up the integro-differential equations of the machine on an electronic differential analyser. It is shown that, if the motor is switched on to the supply at the time when the potential passes through its zero value, there is a pulsating fundamental frequency torque superimposed on the average steady state unidirectional torque. If, on the other hand, the switch is closed when the applied potential passes through its maximum value, the developed electrical torque settles down to its final steady state value during the very first cycle of the supply voltage.

