GENERAL INTRODUCTION
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When a voltage is applied across a thin film (say 100 Å thick) of an insulator, in general, one gets current densities much higher than what one would expect from the bulk specific resistivity values. Several mechanisms have been proposed for the electronic conduction through these thin films of insulators. The exact mechanism of conduction depends upon the nature of the metal and the insulator, the thickness of the insulating film, the ambient temperature, the electrical field, etc. The importance of the study of electronic conduction through these films has increased during recent years, in view of their possible applications in several electronic devices such as thin film tunnel diodes, thin film transistors, negative resistance devices, Gunn diodes, etc. Thin film studies are also important for investigations in the field of superconductors, lasers, electroluminescent materials, etc.

Recent studies have revealed that cadmium sulphide films can find applications in field-effect transistors, negative resistance devices and in microcircuits. During the course of our studies on the diode structures prepared by sandwiching cadmium sulphide film between two aluminium electrodes, we have observed a new phenomenon of dual negative resistance. In the following chapters we present a detailed account of the phenomenon.
The first chapter summarises the different mechanisms suggested by the earlier workers to explain the high current density and the negative resistance observed in the current-voltage characteristics of such structures. In the second chapter we describe the experimental techniques used for the preparation and study of the sandwich structures. In the third chapter the experimental results are described. The discussion of the results and the proposed model for the dual negative resistance is given in the last chapter.