# CONSTRUCTION OF RESISTIVITY PROBE, AND RESISTANCE MEASUREMTS ON $YBa_2Cu_3O_7$ SUPERCONDUCTORS.

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# Abstract

Although superconductivity was discovered long before, so far discovered superconductors are superconducting far below room temperature. Scientists worldwide are in search for room temperature superconductors which would bring a revolution in technology.

This project focuses on the construction of a Resistivity Probe which would measure the resistance of high temperature superconductors; by which the transition temperature of the respective superconductor is obtainable.

The construction is to achieve and control sample temperatures around 77K and above by immersion of the probe into liquid nitrogen. In this probe the heat flow from surrounding to the sample is minimized, and the sample is loosely thermally connected to liquid nitrogen reservoir. The temperature of the sample is controlled by electrical heating.

Temperature control of the experimental region was checked and has been revealed that the vacuum system, the electrical heating and the thermometry of the Resistivity Probe function perfectly well. Further, resistance measurements on two $YBa_2Cu_3O_7$ superconductors were carried out and their superconducting transition temperatures were found to be $T_c$=89.8 K and $T_c$=88.0 K.

The accuracy of the results can be increased if measuring instruments of better resolution are used.

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