## Evolution of Kosterlitz-Thouless-Berezinskii (KTB) Transition in Ultra-Thin NbN Films

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The Kosterlitz-Thouless-Berezinskii (KTB) transition play very important role to determine the superconducting properties of 2D superconductor including high-Tc layered superconductor. In many cases it has been observed that the nature of KTB transition is different from known universal behavior. The non universal nature of KTB transition and the recent discovery of interface superconductivity have renewed our interest to study the KTB transition in conventional 2D superconductor.

Here, we will present detailed experimental study on KTB transition in ultra-thin NbN films.We have measured the superfluid density, normal carrier density and resistivity of a set of NbN films. Major advantage of our model system is that we can measure the superfluid density, normal carrier density and resistivity on same sample. Our results show that while the ground state is well described by BCS theory, at elevated temperatures, ultra-thin films show sudden drop in superfluid density associated with the KTB transition close to Tc. Although the sudden drop started at higher superfluid density expected from 2-D XY model, the nature of transition is well describe by considering the low vortex core energy and slight inhomogeneity in the system. Resistivity data is beautifully explained using effective medium theory (EMT) by considering both Aslamozov-Larkin and KT fluctuation.