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Vortex Noise in the Superconducting Transition of Tin Film[1]
HENGSHENG ZHANG, QIAN CHEN, FULIN ZUO, University of Miami, UNIVERSITY OF MIAMI TEAM — We report preliminary noise studies in the superconducting transition of thin Tin (Sn) films. Voltage noises are measured as a function of temperature and current. The noise spectral power S_v depends strongly on the resistance and current. For small R, $S_v^{1/2}$ is linear with R and is replaced by logarithmic R dependence for large R. The peak in $S_v^{1/2}$ follows closely but always shifted down from dR/dT. I-V characteristics and voltage noises are measured simultaneously to reveal the nature of the excess noises. The I-V curves are indicative of the presence of Kosterlitz-Thouless transition (KT). The noise dependence on voltage suggests strongly the nature of vortex shot noise with a characteristic $V^{1/2}$ dependence for small V and reduction of S_v due to strong correlation of vortices at large V.

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