Density wave like transport anomalies in surface doped Na$_2$IrO$_3$\textsuperscript{1}

YOGESH SINGH, KAVITA MEHLAWAT, Indian Institute of Science Education and Research Mohali, India — We report that the surface conductivity of Na$_2$IrO$_3$ crystal is extremely tunable by high energy Ar plasma etching and can be tuned from insulating to metallic with increasing etching time. Temperature dependent electrical transport for the metallic samples show signatures of first order phase transitions which are consistent with charge or spin density wave like phase transitions recently predicted theoretically. Additionally, grazing-incidence small-angle x-ray scattering (GISAXS) reveal that the room temperature surface structure of Na$_2$IrO$_3$ does not change after plasma etching.

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