Abstract Submitted
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Electric Field Induced Conductivity of Disorder Driven Anderson Insulator[1] VLADIMIR PRIGODIN, ARTHUR EPSTEIN, Ohio State University — The effect of an electric field on the Anderson localization is considered. In the 3d case the field mixing the localized and extended states leads to delocalization. In the 2d case, the localization exponentially weakens with increasing kinetic energy so that in principle any field leads also to total delocalization. The field induced IMT occurs in the 1d case [1]. However, the delocalization effect of field on the Anderson insulator hardly is observable because it is masked by phonon assisted hopping. In the localized phase for each localized state along the field there are remote empty states whose energies are lower and electrons hop to those states by emission of phonons. Therefore the electric field induces the crossover in temperature dependence of hopping conductivity from activation (variable range hopping conductivity) to emission (metallic like conductivity) regime. The results have implications for the recent studies of field effects in polymer based transistors [2].

1. V.N. Prigodin, Sov. Phys. JETP **52**, 1185 (1980

2. F.C. Hsu, *et al.*, Phys. Rev. B, in press (2006); A.S. Dhoot *et al.*, Phys. Rev. Lett. **96,** 46403(2006).

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