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Numerical studies of non-Drude ac-conductivity and infrared magneto-optics in (Ga,Mn)As HUAWEI GAO, JAIRO SINOVA, Department of Physics, Texas A&M University — Optical absorption experiments on (III,Mn)V diluted magnetic semiconductors (DMS's) show that the ac-conductivity has non-Drude behavior at low frequency. STM study show many states deep in the band gap. The numerical simulation of the first problem has been done previously using the effective Hamiltonian model with various treatments of the disorder effects. We re-examine the previous works with a similar numerical method to establish the nature of the transitions in the low to the high-doped regime and also the properties of states in the gap. We use the effective Hamiltonian k.p model to describe the holes introduced by Mn impurities and treat the Mn impurities exactly using the envelope function approximation. We use participation ratios to characterize the localization properties of quasi particle states. This allows us to study the ac-conductivity contributions due to delocalized states to deep in-gap localized states transitions and how the spectral weight is distributed. We will also report on numerical results of the magneto-optical response with this treatment of the effect of disorder.

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