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Optical conductivity of diluted magnetic semiconductors: effects of dynamical screening¹ FEDIR KYRYCHENKO, CARSTEN A. ULLRICH, University of Missouri — Most theoretical studies of transport and optical conductivity in diluted magnetic semiconductors like GaMnAs treat disorder and many-body effects within the simple relaxation time and static screening models. Here we present a more complete theory of transport in charge and spin disordered media that combines a multiband $\mathbf{k} \cdot \mathbf{p}$ approach with a first-principles descriptions of disorder and electron-electron interaction through the memory function formalism and time-dependent density functional theory. We discuss the effects of dynamic screening and collective electron excitations on the charge and spin scattering off Coulomb impurities and fluctuations of localized spins and compare calculated values of optical conductivity in GaMnAs with experimental results.

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