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The contribution of critical spin fluctuations to scattering and spin lifetimes in GaMnAs near the ferromagnetic transition[1] MATTHEW MOWER, G. VIGNALE, University of Missouri — As GaMnAs transitions between the paramagnetic and ferromagnetic phases, the resistivity exhibits a peak due to enhanced scattering from critical spin fluctuations. Existing work typically focuses on the ferromagnetic side, or to a lesser extent the paramagnetic side, far away from the transition; the effect of strong spin fluctuations near the transition has received little attention. We present a simple model of spin exchange mediated by dynamic spin fluctuations, calculated in the GW approximation. This produces a finite peak in the resistivity that is qualitatively accurate. We then use this model to calculate hole spin lifetimes from the relevant spin relaxation mechanisms.

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