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Non-Landau damping of magnetic excitations in systems with localized and itinerant electrons DMITRI EFREMOV, Leibniz-Institute for Solid State and Materials Research, IFW-Dresden, D-01171 Dresden, Germany., JOSEPH BETOURAS, Department of Physics, Loughborough University,Loughborough LE11 3TU, UK., ANDREY CHUBUKOV, Department of Physics, University of Wisconsin-Madison, 1150 University Ave., Madison, WI 53706-1390, USA. — We discuss the form of the damping of magnetic excitations in a metal near a ferromagnetic instability. The paramagnon theory predicts that the damping term should have the Landau form $\gamma(q,\omega) \propto \omega/v_F q$. However, the experiments on uranium metallic compounds UGe_2 and UCoGe showed non-Landau damping $\gamma(q,\omega) \propto \omega/\Gamma$, with $\Gamma = const$ for small q. It would violate the spin conservation in systems with one type of fermions. Recently it has been conjectured that this non-Landau damping can arise due to the presence of both localized and itinerant electrons in these materials, with ferromagnetism involving predominantly localized spins. We present microscopic analysis of the damping of near-critical localized excitations due to interaction with itinerant carriers. We show explicitly how the presence of two types of electrons breaks the cancelation between the contributions to Γ from self-energy and vertex correction insertions into the spin polarization bubble.

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