

Abstract Submitted
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The “Higgs” amplitude mode in weak ferromagnetic metals YI ZHANG, Boston College, PAULO FARINAS, Universidade Federal de Sao Carlos, KEVIN BEDELL, Boston College — Using Ferromagnetic Fermi liquid theory, Bedell and Blagoev derived the collective low-energy excitations of a weak ferromagnet. They obtained the well-known magnon (Nambu-Goldstone) mode and found a new gapped mode that was never studied in weak ferromagnetic metals. In this Letter we have identified this mode as the Higgs boson (amplitude mode) of a ferromagnetic metal. This is identified as the Higgs since it can be show that it corresponds to a fluctuation of the amplitude of the order parameter. We use this model to describe the itinerant-electron ferromagnetic material MnSi. By fitting the model with the existing experimental results, we calculate the dynamical structure function and see well-defined peaks contributed from the magnon and the Higgs. From our estimates of the relative intensity of the Higgs amplitude mode we feel that it can be seen in neutron scattering experiments on MnSi.

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