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Spin wave in quasi-equilibrium spin systems[1] HARI DAHAL, KEVIN BEDELL, Boston College — Using the Landau Fermi liquid theory we can study a quasi- equilibrium spin system at T=0K to determine the dispersion relations of possible collective modes. By quasi-equilibrium spin system we refer to a spin system which has finite magnetization in the absence of an external magnetic field. Such a system has been realized in liquid helium and in spintronic materials using different methods; one of those is the optical pumping. We have predicted the existence of gapless spin wave modes in such a system. We compare the dispersion relations of different modes of the quasi- equilibrium system with those of a paramagnetic system, in the presence of a magnetic field, and a ferromagnetic system. Using the relaxation time approximation for the collision integral we study the effect of temperature on the dispersion relation of the modes. We will also present the behavior of the dynamical structure function as a function of frequency and discuss the contribution of different modes to the sum rules.

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