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Effect of three-body loss on itinerant ferromagnetism in an atomic Fermi gas GARETH CONDUIT, EHUD ALTMAN, Weizmann Institute — A recent experiment has provided the first evidence for itinerant ferromagnetism in an ultracold atomic gas of fermions with repulsive interactions. However, the gas in this regime is also subject to significant three-body loss. We adopt an extended Hertz-Millis theory to account for the effect of loss on the transition and on the ferromagnetic state. We find that the losses damp quantum fluctuations and thereby significantly increase the critical interaction strength needed to induce ferromagnetism. This effect may resolve a discrepancy between the experiment and previous theoretical predictions of the critical interaction strength. We further illuminate the impact of loss by studying the collective spin excitations in the ferromagnet. Even in the fully polarized state, where loss is completely suppressed, spin waves acquire a decay rate proportional to the three-body loss coefficient.

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