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Bose Einstein condensation of magnons in mesoscopic ferromagnets. L.H. BENNETT, E. DELLA TORRE, George Washington University, R.E. WATSON, Brookhaven National Laboratory — Bulk magnetic materials are comprised of magnetic domains. As the size of the sample is reduced, it forms a single domain state. Further reduction of particle size yields a superparamagnetic state. There is an apparent phase transition[1] between the single domain state and the superparamagnetic state at some critical size in the single-domain mesoscopic region. We had found[2,3] a Bose-Einstein condensation in a number of mesoscopic ferromagnets (30 - 60 nm diam). We hypothesize that the superparamagnetic-to-single domain ferromagnetic transition involves the same type of Bose-Einstein condensation.

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