

New Types of Magnon BEC in Superfluid ^3He in Aerogel.

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The Spin Supercurrent and Bose-Einstein condensation of magnons similar to an atomic BEC was observed in 1984 in superfluid ^3He -B. Recently we discovered 2 new types of BEC in superfluid ^3He in deformed aerogel. The orbital part of the wave function orients along the deformation¹ and changes the magnon-magnon interaction. In some cases it forms a magnon trap. We can do it for ^3He -A by uniaxially compressing the aerogel along the magnetic field². The other BEC state was observed in ^3He -B in aerogel stretched along the magnetic field³. Both states show all properties of magnon BEC. We have also observed a splitting of NMR lines near T_c , which seems to indicate the formation of a new phase of superfluid ^3He in aerogel. The latter looks like an analog of the ^3He -A1 phase with strongly enhanced magnetic field.

¹T. Kunitatsu, et. al. JETP Lett. 86, 216 (2007)

²J. Elbs, et.al. Phys. Rev. Lett. 100, 215304 (2008)

³P. Hunger, et. al. J. of Low Temp. Phys 158, 129-134 (2010)