

Direct Observation of a Majorana Quasiparticle Heat Capacity in ^3He

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The Majorana fermion, which acts as its own antiparticle, was predicted by Majorana in 1937. No fundamental particles are known to be Majorana fermions, although there are speculations that the neutrino may be one. There is also theoretical speculation that Majorana fermions may comprise a large fraction of cosmic Dark Matter. While no stable particle with Majorana properties has yet been observed, Majorana *quasiparticles* may exist at the boundaries of topological insulators. Here we report the preliminary results of direct observation of Majorana quasiparticles by deviation of superfluid ^3He heat capacity. The superfluid ^3He heat capacity falls exponentially with temperature. The Majorana heat capacity follows a power law. By reanalyze the data, published in the article ¹ we have found a 10% deviation from exponential law heat capacity at the temperature of 135 μK in a good agreement with the theory ². No any fitting parameters was involved in the analyze. The experiments are in progress.

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2. G. E. Volovik, JETP Lett. **90** 398 and 587 (2009).

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