学术报告

# Landau-Beliaev Damping in a Bose-Fermi Superfluid Mixture

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**Abstract:**

Recently, the Bose-Fermi superfluid mixture is first realized by ENS group. To reveal the effect of quasi-particle interactions in such a superfluid mixture, we consider damping process of the excitation in the Bose superfluid due to its interaction with quasi-particles in Fermi superfluid. We find that the damping rate has quite different threshold behavior at the BCS and the BEC side of the Fermi superfluid. The damping rate is a constant nearby the threshold momentum in the BCS side, while it increases rapidly in the BEC side. This is because in the BCS side the decay processe is restricted by constant density-of-state of fermion quasiparticle nearby Fermi surface, while such a restriction does not exist in the BEC side where the damping process is dominated by bosonic quasi-particles of Fermi superfluid. Our results are related to collective mode experiment in recently realized Bose-Fermi superfluid mixture.

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