

False Vacuum decay and Hawking radiation in Coherently Coupled Bose Gases

Friday, 25 October 2024 13:30 (25 minutes)

In the present talk, I present some recent theoretical and experimental results on the physics of **coherently coupled Bose-Einstein condensates** (BECs). The Ising-like ferromagnetic transition and the elementary excitations of the system are reviewed in order to introduce the phenomenon of bubble formation due to the metastability in the presence of the ferromagnetic critical point. The bubble formation in the coherent BEC field is very much related to the phenomenon of *false vacuum decay*. Numerical and experimental results are therefore compared with an instanton theory for our platform.

Eventually I present the results for possible detection of *massive and massless Hawking-like radiation* using a typical sonic hole configuration for coherently coupled BECs.

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Session Classification: Quantum Gases - Talks on specific topics

Track Classification: Quantum gases