



SEMINARIO

lunedì 14 dicembre 2015 ore 11:00 – Aula 33

Area della Ricerca CNR di Pisa – Edificio A, piano terra

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Dynamics of superfluid ${}^6\text{Li}$ gases through a thin barrier

Quantum gases offer a unique toolbox for simulating complicated condensed matter problems. In particular, thanks to the fine control of the interaction strengths and of the trapping potentials, they provide unique opportunities to explore superfluidity phenomena. In our setup, we produce ${}^6\text{Li}$ quantum gases across the BEC-BCS crossover. We superimpose on the fermionic superfluids a thin barrier, creating an analogue of a Josephson junction. Here, we will report on our results on the study of the coherent dynamics in the different interactions regimes. We observe coherent oscillations throughout the entire BEC-BCS crossover. The Josephson frequency, as a function of the interactions, exhibits a maximum near the crossover region, where the fermionic character of the superfluid becomes relevant. For critical values of the chemical potential difference, we observe the onset of dissipation, via phase slippage processes and the nucleation of topological defects.