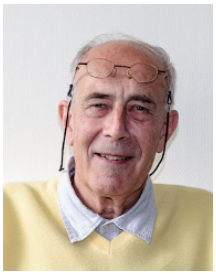

ID de Contribution: **246** Type: **Poster**

Spin-polarized droplets in ultracold Fermi gas

mardi 21 mars 2023 17:30 (1h 30m)

We demonstrate the existence of a new type of spatially localized excitations in the unitary Fermi gas: spin polarized droplets with a peculiar internal structure involving the abrupt change of the pairing phase at the surface of the droplet. It resembles the structure of the Josephson-π junction occurring when a slice of a ferromagnet is sandwiched between two superconductors. The stability of the impurity is enhanced by the mutual interplay between the polarization effects and the pairing field, resulting in an exceptionally long-lived state. We show that the motion of spin-polarized impurity (ferron) in ultracold atomic gas is characterized by a certain critical velocity which can be traced back to the amount of spin imbalance inside the impurity. We have calculated the effective mass of ferron in two dimensions. We show that the effective mass scales with the surface of the ferron. We discuss the impact of these findings; in particular, we demonstrate that ferrons become unstable in the vicinity of a vortex.

Auteurs principaux: Dr TUZEMEN, Bugra (Warsaw University of Technology); Prof. WLAZŁOWSKI, Gabriel (Warsaw University of Technology); MAGIERSKI, Piotr (Warsaw University of Technology)

Orateur: MAGIERSKI, Piotr (Warsaw University of Technology)

Classification de Session: Cocktail & Poster session

Classification de thématique: Cold Atoms