

L. Fallani: *Quantum simulation with two-electron Fermi gases in optical lattices*

We will report on recent experiments performed at LENS with ultracold degenerate ytterbium gases. Thanks to their electronic structure, two-electron atoms offer very interesting possibilities for advanced quantum simulations and for the implementation of synthetic gauge fields. In particular, ^{173}Yb Fermi gases are characterized by a large nuclear spin and highly-symmetric atom-atom interactions, which result in the possibility of performing quantum simulation of systems with intrinsic $\text{SU}(N)$ symmetry. We will report on the optical manipulation and detection of the atomic spin and on the first experimental results recently obtained with ^{173}Yb atoms trapped in optical lattices.