ID de Contribution: **60** Type: **Invited talk**

Ultracold fermionic ytterbium with strong interactions in optical lattices

mercredi 24 février 2016 14:30 (30 minutes)

Using both internal degrees of freedeom of ytterbium, the nuclear spin as well as the electronic spin quantum number, allows to implement novel many-body systems in optical lattices. The interaction properties of yetterbium-173 have proven to be particularly intriguing, with a Feshbach resonance between the singlet and triplet states of the electronic degree of freedom, which we characterize based on the recent predictions by Zhang et al. [1]. Here, the optical lattices allow for detailed quantitative studies of the interaction channels of individual pairs of atoms.
Another aspect of many-body physics with ytterbium is the large spin degree of freedom with the associated strong decoupling of nuclear to electronic degrees of freedom. This allows for very faithful realization of extended-symmetry Fermi-Hubbard systems. We will present the characterization of a strongly interacting SU(N)-symmetric gas of ytterbium in the metal to Mott crossover regime of an optical lattice using in-situ measurements of the equation of state.

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