Boson-fermion pairing in resonant Bose-Fermi mixtures

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I will review recent work on Bose-Fermi mixtures with an attractive interaction inducing pairing between bosons and fermions. After discussing a recent experiment on this system [1], which has confirmed predictions obtained by us some time ago within a many-body diagrammatic approach [2], I will present novel results for the compressibility that suggest a metastable nature for the many-body phase observed in [1]. Then, I will discuss the extension of our calculations to two-dimensional Bose-Fermi mixtures and present novel results for 2D Bose-Fermi mixtures obtained with both perturbative [3] and non-perturbative techniques [4].

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