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The BCS-BEC crossover and the disappearance of FFLO-correlations in a spin-imbalanced, 1D Fermi gas FABIAN HEIDRICH-MEISNER, LMU Munich, ADRIAN FEIGUIN, U Wyoming, ULRICH SCHOLLWOECK, LMU Munich, WILHELM ZWERGER, TU Munich — We present a numerical study of the one-dimensional BCS-BEC crossover of a spin-imbalanced Fermi gas. The crossover is described by the Bose-Fermi resonance model in a real space representation. Our main interest is in the behavior of the pair correlations, which, in the BCS limit, are of the Fulde-Ferrell-Larkin-Ovchinnikov type, while in the BEC limit, a superfluid of diatomic molecules forms that exhibits quasi-condensation at zero momentum. We use the density matrix renormalization group method to compute the phase diagram as a function of the detuning of the molecular level and the polarization. As a main result, we show that FFLO-like correlations disappear well below full polarization close to the resonance. The critical polarization depends on both the detuning and the filling. Heidrich-Meisner, Feiguin, Schollwoeck, Zwerger, arXiv:0908.3074

Fabian Heidrich-Meisner
LMU Munich

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