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Two-component Fermi gas with unequal masses at unitarity: A diffusion Monte Carlo study[1] D. BLUME, Department of Physics and Astronomy, Washington State University, Pullman, WA 99164-2814, G.E. ASTRAKHARCHIK, Department de Fisica i Enginyeria Nuclear, Campus Nord B4-B5, Universitat Politecnica de Catalunya, E-08034 Barcelona, Spain, S. GIORGINI, Dipartimento di Fisica, Universita di Trento and BEC-INFM, I-38050 Povo, Italy — Two-component Fermi gases with varying interaction strengths have been realized in the laboratory using ultracold atoms in two different hyperfine states. In view of experimental efforts to simultaneously cool and trap two fermionic species with different masses, such as Li and K, we investigate the behavior of two-component Fermi gases with unequal masses in the strongly-interacting regime using the diffusion Monte Carlo technique. We consider mass ratios ranging from one to 100, and determine the equation of state at unitarity for a gas with identical number of "spin up" and "spin down" atoms. Furthermore, we determine the pairing gap of the system and interpret our findings.

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