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The Superfluid Pairing Gap of a Unitary Fermi Gas ANNETTE LOPEZ, PATRICK KELLY, ETTORE VITALI, California State University, Fresno — We address the problem of computing the superfluid pairing gap of a fermionic cold gas from first principles. Cold atomic Fermi systems are unique laboratories to explore many-body systems, due to the unprecedented experimental control that can be currently achieved. These systems find applications in condensed matter physics, nuclear physics, and nuclear astrophysics; the ability to provide robust theoretical predictions for cold atoms can have a significant impact in several fields in physics. In particular, cold gases can shed light into some of the most mysterious objects in the universe, like neutron stars. In this work we use unbiased Quantum Monte Carlo techniques interfaced with state of art analytic continuation technique to compute the spectral function of a unitary Fermi gas and the superfluid gap.

Annette Lopez
California State University, Fresno

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