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Examining nuclear pairing correlations in the continuum via a Monte Carlo algorithm[1] MARK LINGLE, ALEXANDER VOLYA, Florida State University — Pairing correlations and pair scattering into the continuum of reaction states play an important role in determining the properties of exotic, near dripline nuclei. Unfortunately, the particle number non-conservation and problems in the limit of weak pairing make the traditional approaches based on the BCS theory ill suited for exploration of these near-dripline nuclei. In this presentation we put forth a Monte Carlo algorithm that suffers none of the drawbacks of traditional theories. The advantages of the Monte-Carlo approach include the ability to handle truly large-scale problems exactly, the absence of the fermionic sign problem, and a probabilistic interpretation of quantum-mechanical amplitudes. Excited states corresponding to pair vibrations are also accessible with this approach. We apply our algorithm to the problem of pairing correlations that extend into the reaction continuum. We model the continuum of reaction states by placing the system of interest in a large box. Using the resulting set of one-body states the pairing problem is then solved exactly. We present benchmarking and model studies as well as applications to oxygen isotopes.

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