Release Node Calculation of Unpolarized Atomic Fermi Gas XIN
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State University — Using release node techniques in diffusion Monte Carlo method,
we study the unpolarized atomic fermi gas in the unitarity regime. We use several
types of the trial and guiding wave functions to elucidate the size of fixed-node error.
We also analyze the changes in the nodal surfaces for trial functions with varying
degree of the pairing strength. We study the bosonic component in guiding functions
in order to optimize the extraction of the fixed-node bias and corresponding error
bars. The most accurate results for the fixed-node bias were obtained using the the
BCS-based guiding functions.

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