Application of the relativistic Brueckner-Hartree-Fock theory in the full Dirac space to optical potentials

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Purpose   Developing microscopic optical potentials by using the relativistic Brueckner-Hartree-Fock (RBHF) theory in the full Dirac space.

Outline   A relativistic microscopic optical potential for nucleon-nucleus scattering is developed based on the ab initio RBHF theory with the improved local density approximation, which is abbreviated as the RBOM potential.

Result   Theoretical predictions on proton-nucleus scattering show good agreements with the experimental data and the results obtained by using phenomenological optical potential (see right figure, arXiv:2402.16339).

Computing system: SQUID
node-hour: 489 SQUID points
memory used: 0.3 GB
parallelize: 1 node