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Toward ab initio DFT: Pairing and Optimized Effective Potential

JOAQUIN DRUT, The Ohio State University — The quest for a universal nuclear energy density functional has stimulated research in many different areas of quantum many-body physics. Advances in the last decade have enabled quantum chemists to explicitly construct energy density functionals for the Coulomb interaction from first principles. This task was accomplished by extending the notion of density-dependent functionals to include explicit dependence on the Kohn-Sham orbitals. The resulting approach is usually called the Optimized Effective Potential (OEP). Are these developments useful in the nuclear case? Can one extend the OEP to include pairing? In this contribution we present some first answers to these and other related questions.

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