

Resolution-of-the-Identity (Density Fitting) Features

- Efficient parallel implementations of RI-J and (occ-)RI-K;
- Analytic gradients for RI-J and (occ-)RI-K;
- Analytic frequencies for RI-J for pure DFT functionals;
- Efficient parallel implementation of RI-MP2;
- Analytic gradients for RI-MP2;
- RI evaluation of double hybrid density functionals;
- RI-CIS(D) implementation;
- RI and Cholesky implementations of many-body methods for ground and excited states from the ADC and CC/EOM-CC family;
- Analytic gradients and properties for RI/CD CCSD and EOM-CCSD;
- Built-in RI versions of the Karlsruhe and Dunning basis sets.

occ-RI-K for Exact Exchange

S. Manzer, P. R. Horn, N. Mardirossian, and M. Head-Gordon, Fast, accurate evaluation of exact exchange: Dr. K. (construction), Change Structure, 201112 (2015).

The occ-RI-K algorithm, J. Chem. Phys 143, 024113 (2015).

Implementation by Evgeny Epifanovsky, Joonho Lee, Fazle Rob, Samuel Manzer



Total SCF time and speedup using the occ-RI-K algorithm for evaluating exact exchange in ω B97X energy calculations. Energy computations of small molecules with large triple-zeta and quadruple-zeta quality basis sets benefit the most from the new algorithm

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