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Correlated Thomas-Fermi: Semiclassical ground-state energies of many-electron systems BRIAN LANDRY, Harvard University, ADAM WASSERMAN, Purdue University, ERIC HELLER, Harvard University — A new semiclassical method is proposed to obtain accurate ground-state energies for many-electron systems. The method borrows its semiclassical character from Thomas Fermi theory (TF), but improves upon it by including correlation effects, at least approximately. We illustrate our method (CTF) on simple models of 1D-interacting electrons, showing that it yields dramatic improvements over TF, particularly in the strongly-correlated regime.

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