Abstract Submitted
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Adiabatic connection fluctuation dissipation theorem density functionals beyond the random phase approximation FILIPP FURCHE, University of California, Irvine — The random phase approximation (RPA) is an increasingly popular starting point for the construction of improved correlation energy functionals. As opposed to semi-local approximations, RPA-based functionals do not suffer from Coulomb self-interaction and naturally include van der Waals interactions; the price is higher computational cost. To compete with traditional correlated wavefunction methods, it is necessary to go beyond the bare RPA. I will analyze successes and failures of recent attempts to do so [1,2], and outline promising future directions.

[1] Z. Yan, J. P. Perdew, and S. Kurth, *Phys. Rev. B* **61** (2000), 16430.
[2] F. Furche and T. Van Voorhis, *J. Chem. Phys.* **122** (2005), 164106.

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