New models for mixing wavefunctions with density functional theory
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The recent realization that the ground-state correlation energy of the random phase approximation (RPA) is intimately connected to an approximate coupled cluster doubles (CCD) model [1], opens interesting avenues for mixing RPA with DFT [2]. I will describe some of the recent work done in our research group on RPA, including applications to van der waals and noncovalent interactions [3]. Time permitting, I will discuss a new mean-field model for describing static (strong) correlations [4-5].

Keywords: RPA, range-separation, strong correlations