

New functionals through factorization of the exchange and exchange-correlation hole

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We present approximations for the exchange and the exchange-correlation hole that share a common form; they are written as a product of two factors. In the case of the exchange hole the factors are the electron density and the exchange factor. In case of the exchange-correlation hole, the factors are the exchange hole and the correlation factor. The exchange factor as well as the correlation factor is determined such that various conditions, e.g. the normalization condition, are satisfied. The implementations as well as initial results for the holes and the exchange-correlation energies are discussed.