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**Exchange-correlation energy functionals for electrons in two dimensions.** S. PITTALIS, Free University Berlin, Germany; European Theoretical Spectroscopy Facility (ETSF); University of Missouri-Columbia, USA, E. RASANEN, University of Jyvaskyla, Finland; European Theoretical Spectroscopy Facility (ETSF), C. PROETTO, Free University Berlin, Germany; European Theoretical Spectroscopy Facility (ETSF), M. MARQUES, CNRS, Universite Lyon I, France; European Theoretical Spectroscopy Facility (ETSF), E.K.U. GROSS, Free University Berlin, Germany; European Theoretical Spectroscopy Facility (ETSF); Max-Planck-Institut fuer Mikrostrukturphysik, Halle, Germany — Two-dimensional (2D) electronic systems have attracted vast interest in condense matter physics since the beginning of semiconductor technology. Density-functional theory (DFT) is among the available theoretical and computational methods to deal with many-electron systems. Fundamental quantity in DFT is the exchange-correlation (xc) energy functional. In practice, this functional needs to be approximated. Many approximations have been developed for three-dimensional (3D) systems that, unfortunately, are inadequate for 2D systems. Hence, there is a clear need for new approximations specifically designed for 2D systems. Following this important need, efficient and practical expressions for the xc-energy of electrons in 2D are presented. Numerical results for finite systems show that the proposed functionals outperform the standard 2D local-spin-density approximation.

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