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4.6.5 Implicit orbital functionals4.6.6 Self-interaction corrections; 4.6.7 Extensions of DFT; 5 Electronic excitations; 5.1 Electric dipole transitions; 5.2 Single-photoelectron emission; 5.2.1 One-electron photoemission from unpolarized targets; 5.2.2 Single photoemission from polarized targets; 5.3 General properties of emitted dipole radiation; 5.4 Symmetry properties of many-body photoexcitations; 5.4.1 Propensity rules for the dichroism in multiple photoionization; 5.5 Resonant photoexcitaions processes; 5.5.1 Single channel; 5.5.2 Multi-channel resonant photoexcitations
5.6 Few-body resonances5.6.1 Regularities and classifications of doubly excited states; 5.6.2 Complex rotation method; 6 Two-electrons systems at the complete fragmentation threshold: Wannier theory; 6.1 Classical mechanics of two excited electrons at the double escape threshold; 6.1.1 Wannier threshold law: a classical approach; 6.1.2 Remarks on the classical treatment of two electrons at threshold; 7 Quantum mechanics of many-electron systems at the double escape threshold; 7.1 Generalities of many-electron threshold escape; 7.1.1 Cross section dependence on the number of escaping particles
7.1.2 Structure of the total potential surface for N electron systems7.1.3 Quantum mechanics of N electrons at low kinetic energies; 7.1.4 Quantal calculations of the universal threshold behaviour; 7.1.5 Incorporation of symmetry and spin in many-particle wave functions; 8 Highly excited states of many-body systems; 8.1 General remarks on the structure of the N particle Schrodinger equation; 8.1.1 The Fock expansion; 8.1.2 The Kato cusp conditions; 8.1.3 Boundary conditions for the N-body problem; 9 The three-body Coulomb system; 9.1 Appropriate coordinate systems
9.1.1 Separation of internal and external coordinates

Sommario/riassunto

Knowledge of the excitation characteristics of matter is decisive for the descriptions of a variety of dynamical processes, which are of significant technological interest. E.g. transport properties and the optical response are controlled by the excitation spectrum. This self-contained work is a coherent presentation of the quantum theory of correlated few-particle excitations in electronic systems. It begins with a compact resume of the quantum mechanics of single particle excitations. Particular emphasis is put on Green function methods, which offer a natural tool to unravel the relations

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