

Electron correlations at nanoscale: single particle states and electronic transport in clusters and qantum nanowires

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I will overview the main results obtained recently for quantum clusters and nanowires using developed by us method incorporating exact diagonalization combined with the ab initio adjustment of electronic orbitals (EDABI method). The nontrivial role of boundary conditions will also be discussed. Explicitly, I will show fundamental results such as the electron distribution function (and its interpretation), the renormalized band structure, and the presence of spin splitting in these nano systems, as well as discuss the transport properties, particularly the optical conductivity. Some prospective problems will be listed at the end.

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