The effect of electron-electron interactions on the conditions of surface state existence

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Electronic surface states in one-dimensional two-band TBA model are studied by use of the Green function method. The local density of states (LDOS) at successive atoms in a semi-infinite chain, even in the case of atoms distant from the surface, is found to be clearly different from that observed in an unperturbed (infinite) chain [1].

The surface atom occupancy is calculated self-consistently [2], with the effect of electron-electron interactions taken into account. The electron-electron interactions are shown to have a significant impact on the conditions of surface state existence.

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[1] S.M. Bose, E-Ni Foo, Phys. Rev B **10** (1974) 3534.
[2] D.W. Schranz, S.G. Davison, Int. J. Quant. Chem. **67** (1998) 377.

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