Jozef Stefan Institute, Department of Theoretical Physics

Solid State Group Seminars

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Dynamical correlation functions of the 1D Hubbard model

I will present the pseudofermion dynamical theory (PDT), which enables the calculation of the thermodynamic behaviour of various dynamical correlation functions for the 1D Hubbard model. First I will focus on the one-electron spectral function, which has singular features on certain lines in momentum-energy plane. In the vicinity of these lines the spectral functions have a power law behaviour and the corresponding exponents can be calculated for any finite Coulomb repulsion, electron filling and spin density. Later I will apply a modified version of PDT to the half-filled model and study the spin dynamical structure factors. I will present the spectra of excitations that contribute to longitudinal and transversal dynamical structure factors. In proximity of the lower thresholds of the excitation spectra, the spin dynamical structure factors exhibit a power law behaviour. I will show the momentum, repulsive interaction and spin density dependence of corresponding longitudinal and transversal exponents. Presented spectral function and spin dynamical structure factor features can be measured using ARPES and inelastic neutron scattering, respectively.

Tuesday, Nov 8, 3pm

Čajna soba F1, Jozef Stefan Institute