

Fizički odsjek, PMF, Sveučilište u Zagrebu
Bijenička cesta 32

Seminar Fizičkog odsjeka

Time	Location
Monday, 4 th July 2022, 14:15	F201
Link	id
https://zoom.us/j/8205066086	820 506 6086

Further development of the precision many-body methods for the studies of the physics of high T_c superconductors, chiral magnets, anomalous Hall effect, etc.

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Development of Diagrammatic Monte Carlo and Stochastic Optimization Analytic Continuation methods led to substantial progress in study of many-body effects in high temperature superconductors which was achieved on the initial stage of the methods development. However, our studies of variety of novel compounds and phenomena led us to conclusion that our methods require substantial further development to include novel physical properties and phenomena (e.g. optical conductivity, mobility, superconducting properties, magnetic phenomena, movement of resonance fermions in cold gases, topological properties, etc.). Moreover, a serious emphasis on the word “precision” in the implementations of many-body methods must be made. To achieve the above goal, we developed Stochastic Optimization Consistent Constrains Analytic Continuation method. This method can be considered as the first method of analytic continuation which can estimate of the error-bars of the analytic continuation result and, thus, can guarantee the maximal precision of the answer. Another substantial progress is the further development of the Diagrammatic Monte Carlo which can give precise answers for many-fermion problems (thus, circumventing famous fermion sign-problem in quantum Monte Carlo, including frustrated magnetic systems). This method is reinforced recently by capability of calculating optical conductivity and mobility, and can be applied to frustrated magnets and topological insulators.

Voditelji seminara FO
Sanjin Benić i Damjan Pelc