MP 11: Gitterfeldtheorie 1

Zeit: Donnerstag 12:00–12:50 Raum: HS 8

MP 11.1 Do 12:00 HS 8

Excited state systematics in extracting nucleon electromagnetic form factors from the lattice — •Thomas Rae[1], Stefano Capitani[1,2], Georg von Hippel[1], Hartmut Wittig[1,2], Benjamin Jäger[1,2], Harvey Meyer[1,2], Bastian Knippschild[1], and Michele Della Morte[1,2] — [1]PRISMA Cluster of Excellence and Institut für Kernphysik, University of Mainz, Germany — [2]Helmholtz Institute Mainz, University of Mainz, Germany

We present recent results for the nucleon electromagnetic form factors using lattice QCD. This includes the determination of the charge radii. The standard approach is to extract the form factors via a plateau fit to the lattice data using a 'large-enough' time separation between the operators at the source and sink. To check that this removes excited state contaminations to an acceptable level, we employ two further extraction methods: a fit that explicitly accounts for the contamination; and the use of a summed operator insertion, which suppresses the contamination. A comparison of the methods allows for the study of systematic effects related to excited state contributions entering in the q^2 dependence of the form factors. We employ the CLS ensembles using non-perturbatively $O(a)$ improved Wilson fermions in $N_f = 2$ QCD.

MP 11.2 Do 12:25 HS 8

Monte-Carlo study of the density of states in graphene with Coulomb interactions — •Pavel Buividovich — Regensburg University, D-93053 Regensburg

I report on the numerical studies of the electronic properties of monolayer graphene, which were done by applying Hybrid Monte-Carlo techniques to the tight-binding model of graphene. The density of states was calculated from the particle number susceptibility with respect to the chemical potential. The results indicate that the Fermi velocity of charge carriers quickly increases as the interactions are turned on. As well, the logarithmic Fraunhofer singularity in the density of states, which is associated with the saddle point in the dispersion relation, becomes much more pronounced. I also discuss the interpretation of these findings in view of the recent experimental studies of the density of states in suspended graphene.