HK 6: Theorie

Zeit: Montag 18:00–19:15 Raum: C

HK 6.1 Mo 18:00 C

Quantum Compilation into Decoherence-Protected Optimised Controls — •Thomas Schulte-Herbrüggen, Andreas Spörl, and Steffen Glaser — Dept. Chemistry, TU-München, 85747 Garching

Quantum compilation lends itself to be tackled as an optimal control problem. Here methods for implementing quantum modules with least amount of dissipation are devised to give best approximations to unitary gates under explicit relaxation. In the widely used Redfield-regime, they are the methods of choice to govern quantum systems within slowly-relaxing subspaces whenever the drift Hamiltonian would otherwise sweep the system through fast-relaxing states of the embedding larger Liouville space. E.g., in a standard model system, Open-GRAPE derived controls give 95% fidelity thus outperforming the 15% obtained by algebraic approaches significantly. Current generalisations to non-Markovian dissipation are included. For quantum compilation in large systems, we provide optimal-control assisted recursive schemes to fight decoherence by substantially faster quantum machine code.

Practical applications and mathematical foundations are discussed. Recent results on local time-reversal will be given in the outlook.

HK 6.2 Mo 18:15 C

Helium 6 in an Effective Theory Framework — •David Canham and Hans-Werner Hammer — Helmholtz-Institut für Strahlen- und Kernphysik (Theorie), Universität Bonn, 53115 Bonn, Germany

The ^{6}He nucleus is a 3-body Borromean halo nucleus. This makes it a promising system for studies based on effective field theory. We develop an effective theory in the framework of the Faddeev equations for 3-body bound states. As a first approximation, we have explored the resonant interaction of the two $n\alpha$ subsystems in the $P_{3/2}$ wave as the only contributing interaction. Both the P-wave scattering volume and effective range enter at leading order in the 2-body subsystem. Our first results indicate a strong cutoff dependence of the 3-body binding energy reminiscent of the Efimov effect.

HK 6.3 Mo 18:30 C

QED_{1+1} bei endlichen Temperaturen in der Lichtkegelform — •Stefan Strauss und Michael Beyer — Institut für Physik, Universitätsplatz 3, 18051 Rostock, Germany

Wir benutzen die DLCQ-Methode (Discrete Light Cone Quantisation) um die Quantenelektrodynamik in $(1+1)$ Dimensionen bei endlichen Temperaturen zu untersuchen. Dazu wird die Zustandssumme des kanonischen Ensembles und das zugehörige thermodynamische Potential für verschiedene Systemgrößen L und harmonische Auflösungen K berechnet. Der Kontinuumlimes $K \to \infty$ und der thermodynamische Limes $L \to \infty$ werden diskutiert. Im Grenzfall vreschwindener Kopplungskonstante werden die numerischen Resultate mit den bekannten analytischen Ergebnissen für das ideale Fermigas verglichen.

HK 6.4 Mo 18:45 C

ZZ-production by graviton mediation within the ADD model — •Martin Kober and Marcus Bleicher — Institut für Theoretische Physik, J.W.G-Universität, Frankfurt am Main

This talk deals with the consideration of ZZ-production mediated by gravitons within the ADD-model. The ADD-model comprises the assumption that space-time consists of additional dimensions compactified with a certain radius. Only gravity can propagate in this new dimensions wheareas usual matter is constrained to live on the world volume of a 3+1-dimensional hypersurface. This model could give an explanation why gravity is so weak compared to the other fundamental forces. In case of a low number of additional dimensions and a quite large compactification radius there could arise a deviation from particle- production-rates predicted by merely incorporating the usual standard model contribution measurable at energies available at the LHC. This possibility is considered for the special case of ZZ-production.

HK 6.5 Mo 19:00 C

Coulomb Gauge Dyson-Schwinger Equations — •Peter Watson and Hugo Reinhardt — Institut fuer Theoretische Physik, Auf der Morgenstelle 14, 72076 Tuebingen, Deutschland

I discuss the Dyson-Schwinger equations of Coulomb gauge Yang-Mills theory within the first order formalism. The first order formalism is motivated and the Dyson-Schwinger equations presented. Certain aspects (cancellation of energy divergences and energy independence of ghosts) are elucidated.