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Complex Langevin simulations with a kernel

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Lattice simulations based on importance sampling suffer from the infamous sign problem when applied to certain physical systems of interest, such as QCD at finite baryon density or real-time quantum field theories. A possible way out is provided by the complex Langevin approach, which is based on a stochastic evolution of complexified degrees of freedom in an auxiliary time direction. However, complex Langevin simulations sometimes fail to produce correct results despite apparently converging correctly. In this talk, I will discuss possible reasons of failure and, in particular, how they may be mitigated by the introduction of a so-called kernel into the complex Langevin equation. Apart from applying such kernels to different systems, I will also outline a novel condition for correctness of the complex Langevin approach.

Parallel Session (for talks only)

QCD at nonzero temperature and density

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