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CP Violation and the Neutron Electric Dipole Moment from Lattice QCD

The search for electric dipole moments (EDMs) remains one of the most sensitive probes of CP violation and physics beyond the Standard Model. In this talk, I will present results from lattice QCD calculations of the neutron EDM induced by the QCD θ-term. I will also discuss hadronic matrix elements of CP-violating effective operators relevant to BSM scenarios—key theoretical inputs needed to connect experimental limits to new sources of CP violation. These calculations highlight both conceptual and technical challenges, including renormalization and the control over systematics. To illustrate the versatility of the underlying methodology, I will briefly present recent results on parton distribution functions (PDFs), showcasing how lattice QCD can access complementary aspects of hadron structure relevant to both low-energy and collider physics.

Secondary track

T05 - QCD and Hadronic Physics

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