Numerical Challenges in Lattice QCD 2022







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Properties of the η and η' mesons

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We summarize our results for the η and η' masses and their four independent decay constants at the physical point as well as their anomalous gluonic matrix elements $a_{\eta^{(\prime)}}$.

The computation employs twenty-one $N_f = 2 + 1$ Coordinated Lattice Simulations (CLS) ensembles with non-perturbatively improved Wilson fermions at four different lattice spacings and along two trajectories in the quark mass plane, including one ensemble very close to physical quark masses. We give details on the evaluation of the disconnected contributions to the pseudoscalar and axialvector matrix elements. The direct determination of both allows us to investigate the singlet PCAC relation and to study the QCD scale dependence of the singlet currents.

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