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Standard Model Prediction for Direct CP-violation in K-decays, and Long-Distance Contributions to Kaonic Ampltiudes (15' + 5')

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Recent theoretical and computational advances have enabled the precision determination of multi-particle Standard Model amplitudes using lattice QCD. In particular the measure of direct CP-violation in kaon decays, \epsilon', has now been computed with errors that are 40% of the experimental value; this quantity is highly sensitive to BSM sources of CP-violation and may help shed light on the origin of the matter-antimatter asymmetry in the Universe. We will discuss this calculation of \epsilon' and our present and future efforts in improving our result. We will also briefly discuss our ongoing calculations of other long-distance contributions to kaonic amplitudes sensitive to new physics.

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