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Unifying Quark and Lepton Flavor Observables through Modular Symmetry

Wednesday 4 December 2024 18:15 (15 minutes)

In this talk, I will present a novel unified analysis of quark and lepton flavor observables within the framework of modular symmetry, focusing specifically on a model based on $2O$ modular symmetry. Using a single complex modulus τ and a well-defined set of real parameters, this model provides a comprehensive description of both quark and lepton sectors under a unified theoretical framework. The model successfully reproduces experimental data, including quark masses, CKM angles, and lepton mixing parameters, while also making precise predictions for quantities yet to be measured, such as the Dirac CP-violating phase, Majorana phases, and neutrino mass observables. These predictions are within reach of upcoming experimental investigations. In addition to presenting the overall results, I will examine in greater detail the correlations between quark and lepton observables, emphasizing the predictive capacity of modular symmetry in addressing key challenges in flavor physics.

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