



Contribution ID: 22

Type: **Long Talk (20 mins)**

The Semi-Leptonic Weak Hamiltonian: Going Beyond Two-Loops

Friday, December 15, 2023 9:10 AM (20 minutes)

The unitarity condition of the Cabibbo-Kobayashi-Maskawa provides an important precision test of the Standard Model. This test requires a good control of different theoretical contributions. In our work, we discuss the short-distance corrections to the weak effective theory as well as the lattice-to-continuum matching for the semi-leptonic four-fermion operator. We compare different renormalization schemes used in the computation of these radiative corrections, namely the W -Mass scheme and the \overline{MS} scheme. We also discuss the calculation of the two-loop $\mathcal{O}(\alpha\alpha_s)$ electroweak corrections and the corresponding three-loop $\mathcal{O}(\alpha\alpha_s^2)$ anomalous dimension for the effective theory Wilson coefficient. We also present numerical results for the $\mathcal{O}(\alpha\alpha_s)$ conversion factor to the regularisation independent scheme, which is used in Lattice calculations.

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