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The Variable Flavor Number Scheme at NNLO and N^3LO:

Thursday, 12 September 2024 14:30 (25 minutes)

In this talk, we combine the four-flavor scheme (4FS) and five-flavor scheme (5FS) into a single prediction such that it retains finite mass effects through a certain order in perturbation theory while at the same time resums the collinear logarithms to all orders in the strong coupling constant (α_s). We match the N^3LO 5FS result for the neutral-current Drell-Yan process including contributions from both photon and Z-boson exchange, with the NLO 4FS computation where the bottom quark is treated as a massive final-state particle. We also match the NNLO five-flavor scheme result for the charged-current Drell-Yan process in exchange of virtual W^+/W^- boson. In this we account for both massive bottom and charm quarks and hence we match five-flavor scheme results against three-flavour schemes.

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