



EINLADUNG

im Rahmen des Teilchenphysikseminars

zum Vortrag

von

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über

***“Bottom and charm quark masses from
quarkonium at N³LO”***

Abstract:

The bottomonium spectrum up to $n = 3$ is studied within Non-Relativistic Quantum Chromodynamics up to N³LO. We consider finite charm quark mass effects both in the QCD potential and the $\overline{\text{MS}}$ -pole mass relation up to third. The $u = 1/2$ renormalon of the static potential is canceled by expressing the bottom quark pole mass in terms of the MSR mass. A careful investigation of scale variation reveals that, while $n = 1, 2$ states are well behaved within perturbation theory, $n = 3$ bound states are no longer reliable. Performing a fit to $b\text{-}\bar{b}$ bound states we fit for the bottom mass. We extend our analysis to the lowest lying charmonium states to fit for the charm mass. Additionally, using a modified version of the MSR mass with lighter massive quarks we are able to predict the uncalculated $O(\alpha_s^4)$ virtual massive quark corrections to the relation between the $\overline{\text{MS}}$ and pole masses.

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Ort: Erwin Schrödinger-Hörsaal, Boltzmann-gasse 5, 5. Stock

gez.: A. Hoang, H. Neufeld