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Scale setting for QCD with $N_f = 3 + 1$ dynamical quarks

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We present first results of the scale setting for QCD with $N_f = 3+1$ dynamical quarks on the lattice. We use a recently proposed massive renormalization scheme with a non-perturbatively determined clover coefficient. To relate the bare coupling of the simulations to a lattice spacing in fm, we use decoupling of charm at low energy and the value of a dimensionless quantity $\sqrt(t_0^\star)m_{had}$, where m_{had} is an experimentally accessible quantity and $t_0^\star$ is the flow scale t_0 at our mass point with $m_{up} = m_{down} = m_{strange}$ and a physical charm mass. We discuss the setup, tuning procedure, simulation parameters and measurement results for two ensembles with different volumes and present a charmonium spectrum.

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