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Towards the physical charmonium spectrum with improved distillation

Tuesday 18 July 2023 14:00 (20 minutes)

A recently proposed modification to the widely used distillation framework yields a substantial improvement in the calculation of the spectrum of charmonium with different J^{PC} at almost no additional computational cost compared to the standard distillation framework. This improved variant is now used to calculate the charmonium spectrum in an $N_f = 3+1$ ensemble at the SU(3) light flavour symmetric point ($m_\pi \approx 420$ MeV), physical charm quark mass and fine lattice spacing ($a \approx 0.043$ fm). The resulting charmonium operators yield a much better overlap with the energy eigenstates compared to standard distillation, showing that the proposed method is suitable for close-to-physical setups. We compare the spectrum and mass splittings of charmonium below threshold to their values in nature and find good agreement in most cases.

Consent

I consent to recording/broadcasting my presentation.

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