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## Twisted mass gauge ensembles at physical values of the light, strange and charm quark masses

*Friday, 30 July 2021 07:15 (15 minutes)*

Lattice QCD simulations directly at physical masses of dynamical light, strange and charm quarks are highly desirable in order to remove systematic errors due to chiral extrapolations. However such simulations are still challenging. We discuss the adaption of efficient algorithms, like higher order integrators or multi-grid methods, within the molecular dynamics of the Hybrid Monte Carlo algorithm, that are enabling simulations of a new set of gauge ensembles by the Extended Twisted Mass collaboration (ETMC).

We will present the status of the on-going ETMC simulation effort that aim to enable studies of finite size and discretization effects. We work within the twisted mass discretization which is free of odd-discretization effects at maximal twist. We will discuss our tuning procedure and first physical results and give an outlook of future plans.

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**Session Classification:** Algorithms (including Machine Learning, Quantum Computing, Tensor Networks)

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