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Neutron Electric Dipole Moment with Enhanced Low Mode Statistics

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We will present preliminary findings on improving the lattice calculation of the neutron electric dipole moment from the θ term in QCD. The neutron EDM is highly correlated with the lowest lying modes of the Dirac operator. We take advantage of this with a full volume sampling for the low mode part of the quark propagator in order to increase statistics. This augments the all-mode averaging technique using a large number of sources for each configuration. We use the method of measuring the energy shift of the two-point correlation function in a uniform background electric field. Initial results are for a $16^3 \times 32$ ensemble of domain-wall fermions at m_π = 420 MeV.

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