NLO Corrections to Deeply-Virtual Compton Scattering ◇

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We have calculated the NLO corrections to the twist-2 part of the deeply-virtual Compton scattering amplitude. Our results for the transverse and antisymmetric parts agree with recent calculations by Ji and Osborne and by Belitsky and Müller. In addition we present NLO results for the longitudinal part of the amplitude.

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Statistical Properties at the Spectrum Edge of the QCD Dirac Operator ◇

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The statistical properties of the spectrum of the staggered Dirac operator in a $SU(2)$ lattice gauge theory are analyzed both in the bulk of the spectrum and at the spectrum edge. Two commonly used statistics, the number variance and the spectral rigidity, are investigated. While the spectral fluctuations at the edge are suppressed to the same extent as in the bulk, the spectra are more rigid at the edge. To study this effect, we introduce a microscopic unfolding procedure to separate the variation of the microscopic spectral density from the fluctuations. For the unfolded data, the number variance shows oscillations of the same kind as before unfolding, and the average spectral rigidity becomes larger than the one in the bulk. In addition, the short-range statistics at the origin is studied. The lattice data are compared to predictions of chiral random-matrix theory, and agreement with the chiral Gaussian Symplectic Ensemble is found.

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The Microscopic Spectrum of the QCD Dirac Operator with Finite Quark Masses ◇

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We compute the microscopic spectrum of the QCD Dirac operator in the presence of dynamical fermions in the framework of random-matrix theory for the chiral Gaussian unitary ensemble. We obtain results for the microscopic spectral correlators, the microscopic spectral density, and the distribution of the smallest eigenvalue for an arbitrary number of flavors, arbitrary quark masses, and arbitrary topological charge.

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