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Structure functions at small x from worldlines: polarized distributions

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The worldline representation of quantum field theory is a powerful framework for the computation of perturbative multi-leg Feynman amplitudes. In particular, in gauge theories, it provides an efficient way, via point particle Grassmann functional integrals, to compute spinor and color traces in these amplitudes. In my talk I will give a short introduction into the worldline formalism and show how it can be applied to the problem of computation of the polarized deeply inelastic structure function g_1 in the small x Regge limit of QCD. In particular, in a shockwave approximation valid in this limit, I will show how one can derive a polarized dipole model. I will discuss computation of sub-eikonal corrections which give rise to the quark and gluon operators of the model and introduce a generalization of the standard McLerran-Venugopalan (MV) model which represents the spin structure of hadrons at small-x.

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