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Automatic differentiation for Balitsky-Kovchegov equation

We present an implementation of the Balitsky-Kovchegov (BK) evolution equation solver using differentiable programming. First and second derivatives of the amplitude with respect to the initial condition parameters are automatically calculated at all stages of the simulation. This should considerably facilitate and speed up the procedure of fitting initial condition parameters to data. Moreover, in the context of Transverse Momentum Distributions (TMD), we demonstrate that automatic differentiation can be used to obtain derivatives of the amplitude with respect to the quark-antiquark separation with better precision than the finite difference method.

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