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A new look at the nonlinear sigma model

The progress on theoretical new methods and approaches in QFT has been mostly concentrated in two directions: studies of supersymmetric gauge theories and the attempts to extend and apply these methods to high-energy QCD that is relevant for LHC physics. On the other hand, the recent progress in low energy QCD and hadronic sector was mostly concentrated in particular predictions for relevant physical processes using standard apparatus of Feynman diagrams.

We will present the study of the simplest case of effective field theory - the chiral $SU(N)$ nonlinear sigma model. For last several decades it has played an extremely important role not only in the low energy phenomenology but also in many other areas of theoretical physics. We will show that the scattering amplitude of n Goldstone bosons can be reconstructed using BCFW-like recursion relations. This method does not rely on the Lagrangian description and the only input is the four-point amplitudes together with the known analytic properties.

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