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QCD at high energy and the Parton Reggeization Approach

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An overview of recent results (2010-2015) obtained in the Parton Reggeization Approach (PRA) are presented. The dominance of multi-Regge final states in particle production at high energies needs the kt-factorization (high-energy factorization) approach for description of hard hadron-hadron collisions instead of the collinear approximation of the conventional Parton Model. The Lipatov's effective theory of Reggeized gluons and quarks is used to obtain gauge invariant amplitudes with off-shell initial Reggeized gluons and quarks. It is shown that LO in alpha_s calculations in the PRA describe well different data from HERA, Tevatron and the LHC (heavy quark jet, heavy meson and heavy quarkonium, single jet and prompt photon, pairs of jets and photons, Drell-Yuan pairs production, associated jet plus photon production). NLO* approximation of Parton Reggeization Approach for a photon plus jet production at HERA and photon pair production at Tevatron and LHC are discussed.

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