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Exclusive production of Higgs boson, $b\bar{b}$ and gluonic jets

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We discuss the central exclusive production of Higgs boson and $q\bar{q}$ pairs in proton-proton (proton-antiproton) collisions at LHC and Tevatron.
The amplitude for both processes is derived within the k_t-factorization approach and discussed in different kinematical asymptotia.
In particular, we consider important high-p_t and massless quark limits for $q\bar{q}$ production.
Rapidity distributions, quark jet p_t distributions, invariant $q\bar{q}$ mass distributions, angular azimuthal correlations between outgoing protons and between ougoing jets are presented.
Exclusive $b\bar{b}$ production constitutes an irreducible background for exclusive Higgs production
The $b\bar{b}$ background is analyzed in detail, in particular we study how to impose cuts to maximize signal-to-background ratio and show some solutions.

We consider also central exclusive production of gg dijets.
The amplitude for the process is derived within the k_t-factorization approach (with both the standard QCD and the Lipatov's effective 3-gluon verticies) and is considered in various kinematical asymptotia, in particular, in the important limit of high-p_t jets. Compared to earlier works we include emissions of gluons from different gluonic t-channel lines.
Rapidity distributions, gluon jet p_t distributions, invariant dijet mass distributions, angular azimuthal correlations between outgoing protons and jets are presented. We explore the competition of the standard diagram with both jets emitted from a single t-channel gluon and the one with the emission from both t-channel gluons. We find that the latter contribution is much smaller than that known from the literature. It becomes comparable only when the jet rapidity difference is large or the gluon transverse momenta are very small. It can, therefore, give contributions to the central diffractive production of mesons. We compare our results with the Tevatron data for exclusive dijets.

\item R. Maciu{\l}a, R.S. Pasechnik and A. Szczurek, "Exclusive double-diffractive production of open charm in proton-proton and proton-antiproton collisions", Phys. Lett. {\bf B685} (2010) 165.

\item R. Maciu{\l}a, R. Pasechnik and A. Szczurek, "Exclusive $b\bar{b}$ pair production and irreducible background to the exclusive Higgs boson production", Phys. Rev. {\bf D82} (2010) 114011.

\item R. Maciu{\}a, R. Pasechnik and A. Szczurek, "Central exclusive quark-antiquark dijet and Standard Model Higgs boson production in proton-(anti)proton collisions, arXiv:1011.5842, to be published in Phys. Rev.D

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