

Central exclusive production of K^+K^- pairs in proton-proton collisions

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Collaboration

Abstract content

We discuss central exclusive diffractive production of light mesons in the reactions $pp \rightarrow pp\pi^+\pi^-$ and $pp \rightarrow ppK^+K^-$. The calculation is based on a tensor pomeron model [1] and the amplitudes for the processes are formulated in an effective field-theoretic approach. We include a purely diffractive dipion continuum, and the scalar and tensor resonances decaying into pseudoscalar meson pairs including both pomeron and reggeon exchanges [2, 3]. We discuss how two pomerons couple to tensor meson $f_2(1270)$ and the interference effects of resonance and dipion continuum. We consider also the ρ^0 and Drell-Söding photoproduction mechanism [4]. We discuss also the $pp \rightarrow pp\pi^+\pi^-\pi^+\pi^-$ reaction via the intermediate $\sigma\sigma$ and $\rho\rho$ states [5] and our recent results on the $pp \rightarrow pp\phi\phi$ reaction which leads to the $ppK^+K^-K^+K^-$ final state [6]. The theoretical results are compared with existing WA102, ISR, COMPASS, STAR, CDF, and CMS experimental data and predictions for planned or being carried out experiments STAR, ALICE, ATLAS+ALFA, CMS+TOTEM, LHCb are presented. The distributions in rapidities and transverse momenta of outgoing protons and pions, the distributions in dimeson invariant mass, in a special “glueball filter variable”, as well as correlations in the azimuthal angle between outgoing particles are presented. We show the influence of the experimental cuts on the integrated cross section and on various differential distributions for outgoing particles.

1. C. Ewerz, M. Maniatis, O. Nachtmann, *Annals Phys.* 342 (2014) 31
2. P. Lebiedowicz, O. Nachtmann, A. Szczurek, *Annals Phys.* 344 (2014) 301
3. P. Lebiedowicz, O. Nachtmann, A. Szczurek, *Phys. Rev. D* 93 (2016) 054015
4. P. Lebiedowicz, O. Nachtmann, A. Szczurek, *Phys. Rev. D* 91 (2015) 074023
5. P. Lebiedowicz, O. Nachtmann, A. Szczurek, *Phys. Rev. D* 94 (2016) 034017
6. P. Lebiedowicz, publication in preparation.

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