

Recent progress in exclusive and semi-exclusive processes in proton-proton collisions

I will review recent progress in exclusive production of mesons and dileptons in proton-proton collisions.

This includes exclusive production of J/ψ , ψ' and ρ^0 mesons as well as production of two pions, two leptons, two photons or two charged Higgs bosons.

In the case of the charmonia a k_t -factorization method with unintegrated gluon distributions is applied. A possible sign of the onset of saturation will be given. The charmonium wave function effects will be discussed.

In the case of ρ^0 and $\pi^+ \pi^-$ production we apply a model of tensor pomeron, a new concept being actively developed and tested in recent 2 years, to the production of continuum and resonances. A discussion of processes with electromagnetic dissociation (large rapidity gap) will be discussed as an example for dilepton production. Exclusive production of two charged Higgs boson will be discussed in the context of searches for these exotic objects at the LHC and FCC.

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