

Meson Production in Diffractive Dissociation of 190 GeV/c π^- into $\pi^-\pi^+\pi^-$ Final States

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COMPASS is a multi-purpose fixed-target experiment at the CERN Super Proton Synchrotron investigating the structure and spectrum of hadrons. Its large acceptance, high resolution, and high-rate capability make it an excellent device to study the properties of light mesons produced in diffractive reactions. We present results from a partial-wave analysis of the diffractive dissociation of a 190 GeV/c π^- beam into $\pi^-\pi^+\pi^-$ final states on nuclear targets. This reaction provides clean access to the light-quark meson spectrum up to 2.5 GeV/c². A partial-wave analysis of the first data sample taken during a pilot run in 2004 on a lead target showed a significant spin-exotic $J^{PC} = 1^{-+}$ resonance [1] compatible with the controversial $\pi_1(1600)$, which is considered to be a candidate for a non- $q\bar{q}$ mesonic state. In 2008 COMPASS collected a diffractive $\pi^-\pi^+\pi^-$ data sample of unprecedented statistics using a hydrogen target. We present the status of the partial-wave analysis of this data set in the kinematic region $t' \in [0.1, 1.0]$ (GeV/c)², where we in particular focus on the comparison of the 2004 and 2008 data, which were taken using different target materials.

[1] M. Alekseev *et al.*, submitted to Phys. Rev. Lett., arXiv:0910.5842 (2010).

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