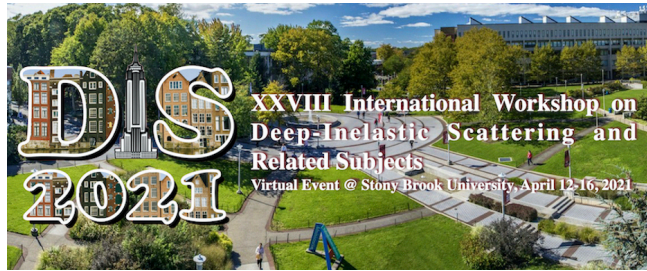


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Central exclusive diffractive production of axial-vector f_1 mesons in proton-proton collisions

Thursday, 15 April 2021 09:30 (18 minutes)

We present a new study of the central exclusive diffractive production of $f_1(1285)$ and $f_1(1420)$ mesons in proton-proton collisions within the tensor-pomeron approach [1], [2]. Two ways to construct the pomeron-pomeron- f_1 coupling are presented. We adjust the parameters of our model to the WA102 experimental data [3] and compare with predictions of the Sakai-Sugimoto model, where the couplings are determined by the mixed axial-gravitational anomaly of QCD [4]. Then we present our predictions for the energies available at the LHC. The total cross section and several differential distributions are presented. Absorption corrections are included for our final distributions. Our results may be used to investigate the $pp \rightarrow pp\pi^+\pi^-\pi^+\pi^-$ reaction at RHIC and LHC energies; see e.g. [1], [5]. The four-pion final state is also interesting in searches for glueball. We predict a much larger cross section for production of $f_1(1285)$ than for production of $f_2(1270)$ in the $\pi^+\pi^-\pi^+\pi^-$ decay channel for the LHC energies. This opens a possibility to study the $f_1(1285)$ meson in experiments at the LHC. Some effort to measure central exclusive four-pion production was initiated already by the ATLAS Collaboration [6].

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