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Investigations of the photo-production of low- and high-mass systems with the CMS detector

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The high-energy proton-proton collisions at the LHC can be used to investigate the electromagnetic interactions as a photon collider. Such production mechanism considers the long-range interactions via photon fusion, which allowed the CMS Collaboration to study the two-photon production of dileptons and dibosons at 7 and 8 TeV. In particular, the kinematics accessible by the CMS detector also provides the means to investigate high-order photon interactions, such that the light by light scattering in heavy-ion collisions. As a complementary production mechanism, the photon-proton interaction is an interesting way to study the elastic and nonelastic production of resonances, like vector mesons and vector bosons. In this case, the diffractive interaction by Pomeron exchange is employed to describe the colorless interaction between the photon and the colliding proton. The latest results on photo-production of resonances at CMS are reported, presenting the estimations for low- and high-mass channels in proton-proton and proton-Lead collisions. These results include the comparison of the estimated photon-proton cross section to the results from other experiments.

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