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Central Exclusive Production at the LHC within the CMS Collaboration

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The Large Hadron Collider (LHC) is a circular particle accelerator located in Geneva (Switzerland). The aim of the accelerator is boosting a beam of protons up to an energy of 6.5 TeV. Subsequently, protons are forced to collide, generating a collection of particles. These particles will interact with a detector located around the interaction point and their kinematic quantities will be measured. The study of the products of the collision can give us relevant information about the
nature of the interaction.
In this seminary, the speaker will give an overview about the so called 'central exclusive production processes' (CEP). In such events, the incoming protons interact without dissociating: as a result of the interaction, protons result deflected from the beam-line and lose energy. The energy lost is used to create a new system of particles in the final state. Therefore, the final state is composed by two protons, slightly deflected from the beam line, and a set of extra particles. In the studies reported, the protons are measured by the Precision Proton Spectrometer (PPS) while the system of extra particles is measured by the Compact Muon Solenoid (CMS).
The seminary will focus on two particular processes: the CEP of quark top-anti/top pairs and of tau-anti/tau pairs. The first study has already been published, while the second one is ongoing.

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