

Measurement of exclusive $\gamma\gamma \rightarrow \mu^+\mu^-$ events in the ATLAS Experiment

Thursday 12 February 2015 15:20 (20 minutes)

measurement was made of the exclusive production of muon pairs in 4.5 fb^{-1} of ATLAS data collected at a centre of mass energy of 7 TeV. Exclusive interactions in this context occur when two charged hadrons interact via photon exchange and escape the interaction intact while at the same time creating particle anti-particle pair. This work will search for exclusive interactions in proton-proton collisions creating a muon anti-muon pair. We are considering di-muon production due to the accuracy with which muons can be tracked by the ATLAS detector. At high luminosities in the LHC, on the order of 20 interactions per beam crossing are to be expected. This pile-up of interactions creates a significant challenge by inducing a large amount of background which must be disentangled from the signal. In previous experiments exclusive interactions were measured in events with no pile-up. As the LHC reaches higher luminosities, such events become negligibly rare and thus a way of finding these events even in the presence of pile-up is essential. Exclusive production is a process well described by Quantum Electrodynamics and as such measuring the cross-section allows for a precise test of the Standard Model.

Presenter: SCHENCK, Ferdinand Wilhelm (University of Cape Town (ZA))