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Measurement of the W boson mass with the ATLAS detector

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A precise measurement of the mass of the W boson represents an important milestone to test the overall consistency of the Standard Model. Since the discovery of a Higgs Boson, the W boson mass is predicted to 7 MeV precision, while the world average of all measurements is 15 MeV, making the improved measurement an important goal.

The ATLAS experiment at the LHC represents an ideal laboratory for such a precise measurement. Large samples of many millions of leptonic decays of W and Z bosons were collected with efficient single lepton triggers in the 7 TeV data set corresponding to an integrated luminosity of 4.6/fb. With these samples the detector and physics modelling has been studied in great detail to enable a systematic uncertainty on the measurement that approaches the statistical power of the data of 7 MeV per decay channel as far as possible.

Primary authors: ESCALIER, Marc (LAL-Orsay (FR)); BALLI, Fabrice (CEA/IRFU,Centre d'étude de Saclay Gif-sur-Yvette (FR))

Presenter: BALLI, Fabrice (CEA/IRFU,Centre d'étude de Saclay Gif-sur-Yvette (FR))

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