

SHOTLIST

Video News Release: new ATLAS measurement of W boson mass

00'00'' Aerial view of CERN with the accelerator complex and the Large Hadron Collider (LHC) perimeter highlighted in animation. The four main experiments of the LHC are indicated around the ring at their interaction points. Beam animation follows

00'04' Drone view of the CERN Control Centre, where the entire accelerator complex is operated from.

00'10'' Inside the Large Hadron Collider underground tunnel, with close up of the main superconducting magnets, the blue dipoles. Animation of proton beams circulating in opposite directions.

00'12'' Inside the ATLAS experiment cavern, 100 m below ground at LHC Interaction Point 1, during maintenance work on the various components of the ATLAS detector. (00'17'') The LHC beampipe can be seen crossing through the ATLAS Muon Wheel and the magnet;

00'23'' Crane lifting new ATLAS Small Muon Wheels during their installation.

00'32'' Visualization of collisions between the LHC proton beams in the centre of the ATLAS detector

00'37'' Interview of Pamela Ferrari, scientific coordinator of the ATLAS collaboration.

TEXT Interview:

The W is a fundamental parameter of the Standard Model and as such, if we measure something that slightly differs with respect to what the SM predicts, this will be a hint of new physics. What we have done is that we have reanalyzed our data and we managed to reach a much better precision. Initially we had a 19 % MeV precision and now we have a 16% MeV precision of the W mass. This accounts for a 16% improvement of this difficult quantity to measure. Every % of improvement is really difficult to reach. The comparison with respect to previous measurements confirms us that our measurements are in agreement with the SM. How did we obtain that ? We obtained it by improving our analysis methods, decreasing the systematic errors that we had on the measurement. Then we used a better knowledge of the modelling of the production process of the W and of the substructure of the proton. Of course this is not the end of the story. We will use new data that hasn't been analyzed to investigate this further. So this is still an open quest and the future will tell us more.

02'07'' Plot illustrating the comparison of the measured value of the W boson mass with other published results. The vertical bands show the Standard Model prediction, and the horizontal bands and lines show the statistical and total uncertainties of the results.

02'19'' Event display. Animated view of a candidate $W \rightarrow \mu\nu$ event using proton-proton collisions at 7 TeV centre-of-mass energy at the LHC. Starting from the centre of the ATLAS detector, the reconstructed tracks of the charged particles in the ATLAS Inner Detector are shown as red lines. The energy deposits in the ATLAS calorimeters are shown as yellow boxes. The identified muon is shown as a long red dashed line. The missing transverse momentum is shown by a green dashed line.