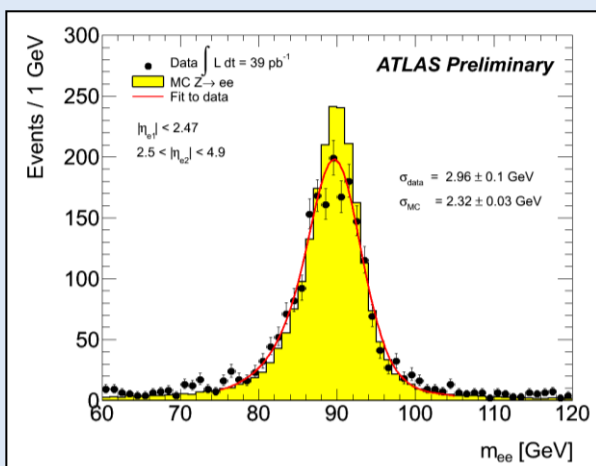


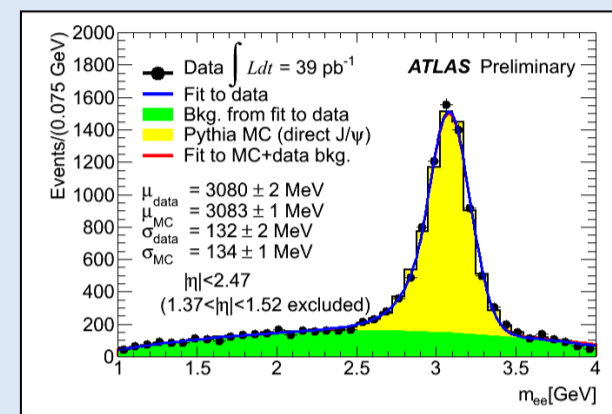
During the 2010 LHC run the ATLAS detector recorded 45 pb^{-1} of proton-proton collision data with 93.6 % data taking efficiency and $9.17 \mu\text{b}^{-1}$ of heavy ion collision data. This poster presents the main performance results for each sub-detector which enabled the excellent ATLAS performance during the past year. Particle identification, alignment, tracking resolution and efficiency results are shown for the Inner Detector and Muon Spectrometer. Results on electromagnetic and jet energy scales are presented for the Liquid Argon and Tile calorimeters. Finally, the LUCID and ZDC luminosity measurements are described.

Liquid Argon Calorimeter

- LAr Calorimeter operational during 2010 ($\epsilon_{\text{DQ}} \sim 90\%$)
- Z boson invariant mass is used to set absolute energy scale of EM calorimeter
- EM scale correction:
$$E_{\text{corr}} = \frac{E_{\text{meas}}}{1 + \alpha}$$
- Corrections are applied to electron energy when reconstructing J/Psi invariant mass
 - Excellent Data/MC agreement
- Uncertainty on absolute EM scale
 - 0.5-1.5% for $|\eta| < 2.5$
 - $\sim 3\%$ in the forward region



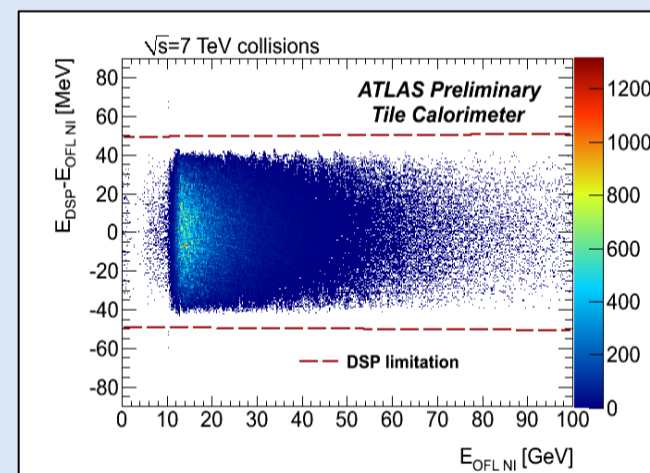
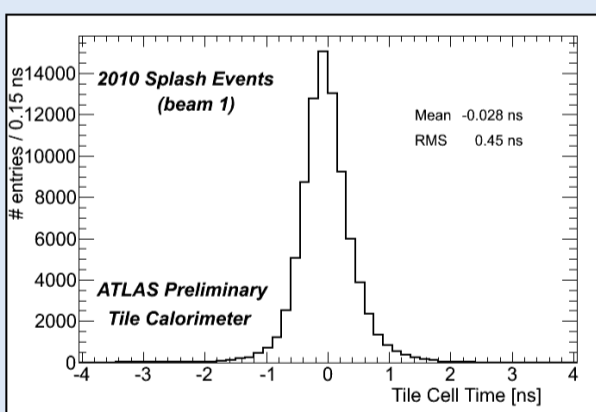
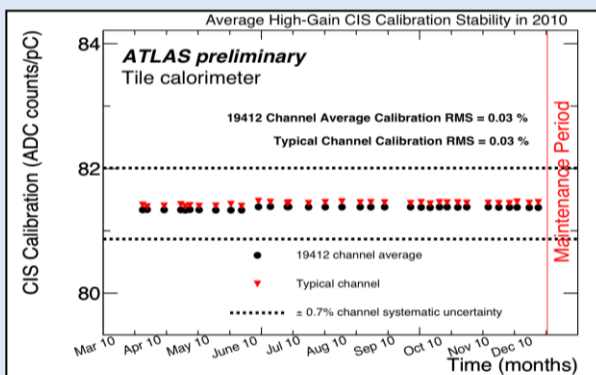
Central-Forward Z $\rightarrow e^+e^-$ invariant mass.



Calibrated J/Psi $\rightarrow e^+e^-$ invariant mass.

Tile Calorimeter

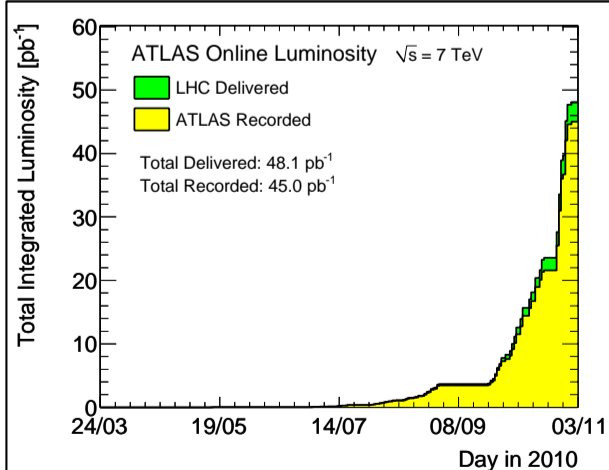
- Tilecal delivered 100% usable data for 2010 physics runs
- High rate trigger tests have demonstrated that Tile is able to reach 75kHz while still recording raw data for a subset of channels with signal
- Charge injection calibration constants show stability of the electronics over the 2010 data taking period of 0.03%
- During 2010, channels were timed in using splash events. The distribution of Tile cell times has an RMS of 0.45 ns
- The validation of the EM scale at the cell level has been pursued with cosmic muons in 2010 and its uncertainty agrees with the published result (of 4%)



- Energy reconstruction performed on the hardware has been validated to be consistent with design specifications

Luminosity

- LUCID provided the ATLAS online luminosity that was sent to the LHC.
- LUCID also provided without interruptions the luminosity used for all offline analysis in ATLAS.
- Beam separation scans allowed the calibration of the LUCID luminosity with a systematic error of 3.2%.



- LUCID is able measure luminosity for individual LHC bunches both online and offline.
- The background in the LUCID luminosity measurement is negligible.

- pp: Luminosity measurements (calibrated by van der Meer scans)
- HI: Main ATLAS trigger with final number of bunches
- Below: 1n, 2n, 3n peaks from E.M. dissociation clearly visible in the ZDC data

