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CMS-DP-2012/015
ECAL Detector Performance Plots: 2012 data

Abstract: Detector Performance Plots of the CMS Electromagnetic calorimeter, based on the 2012 pp data sample. Plots include: laser response monitoring, energy calibration, energy scale stability and detector resolution.

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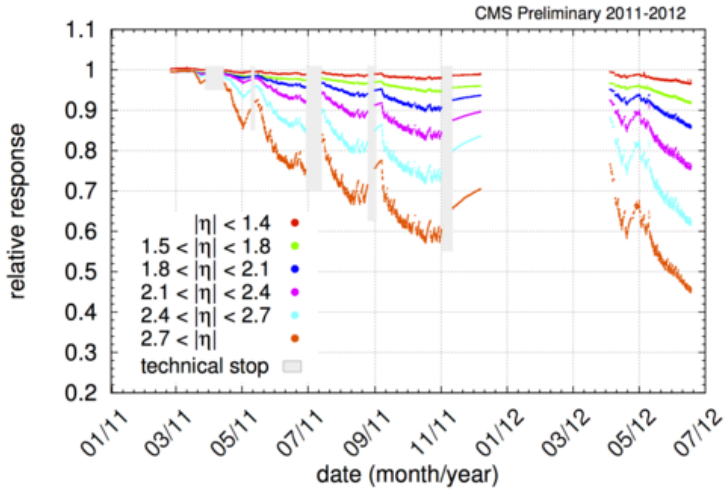
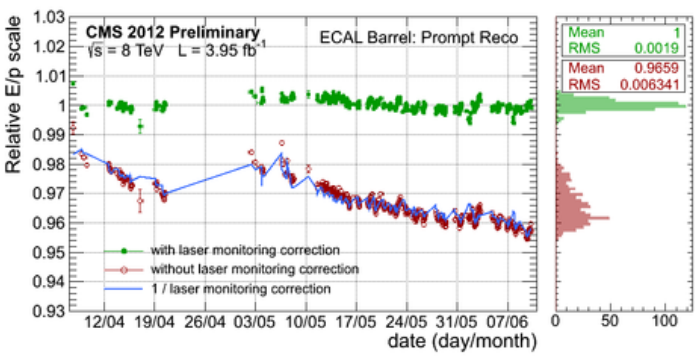
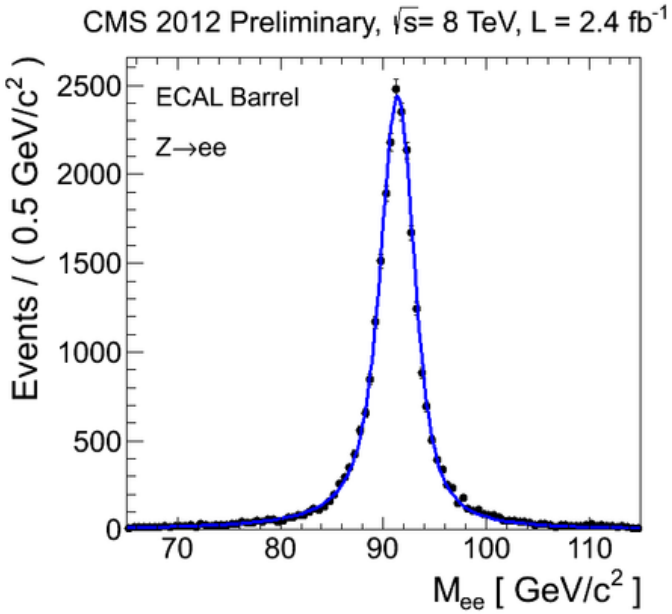
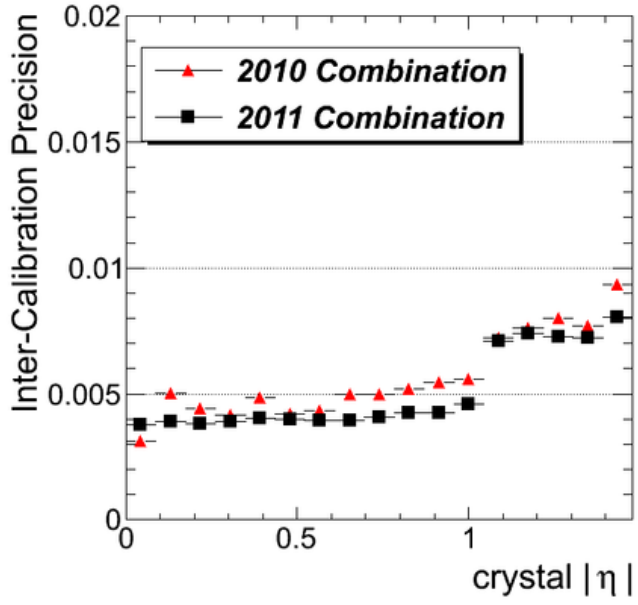
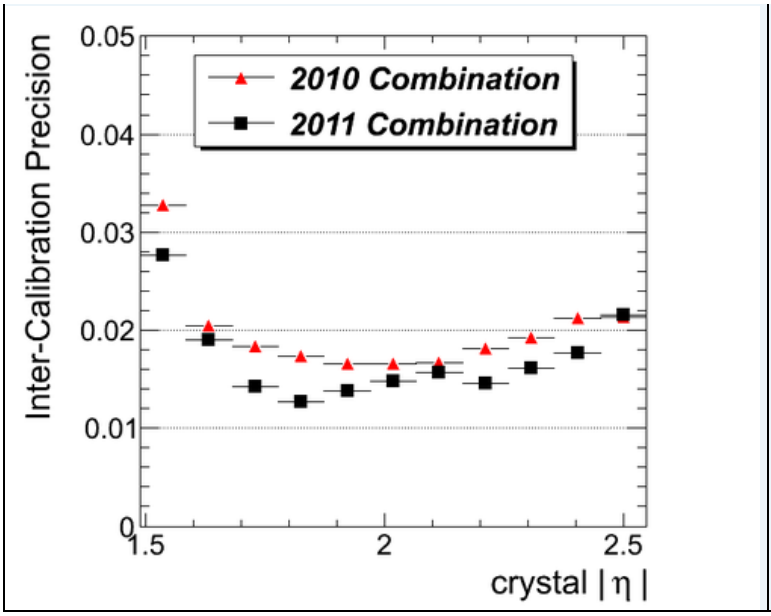
Figure	Caption
pdf version 	***Relative response to laser light (440 nm) measured by the ECAL laser monitoring system, averaged over all crystals in bins of pseudorapidity, for the 2011 and 2012 data taking periods*** The response change observed in the ECAL channels is of the order of a few percent in the barrel, while it reaches up to 25% in the most forward endcap regions used for electron and photon reconstruction. The response change is up to 55% in channels closest to the beam pipe. This is an update of the plot appearing in CMS-DP-2012/007, and includes measurements taken during 2012. These measurements are used to correct the physics data.
pdf version 	***History plot for 2012 data of the ratio of electron energy E, measured in the ECAL Barrel, to the electron momentum p, measured in the tracker*** This is an update of the energy scale stability vs time plots from E/p presented in CMS-DP-2012/002 and CMS-DP-2012/007, but for 2012 data. The history plots are shown before (red points) and after (green points) corrections to ECAL crystal response due to transparency loss are applied. The magnitude of the average transparency correction for each point (averaged over all crystals in the reconstructed electromagnetic clusters) is indicated by the continuous blue line. **A stable energy scale is achieved throughout the 2012 run, for prompt**

	reconstructed data, after applying transparency corrections. The average signal loss of 4% in the ECAL barrel is corrected with an RMS stability of 0.19%
pdf version  	***Z->ee invariant mass plot for 2012 data, from the reconstruction of di-electron events with both electrons in the ECAL Barrel*** The plot includes only electrons with low energy loss through bremsstrahlung in the CMS tracker. The plot shows the improvements in Z->ee energy scale and resolution that are obtained from applying energy scale corrections to account for the intrinsic spread in crystal and photo-detector response, and time-dependent corrections to compensate for crystal transparency loss. **The instrumental resolution (width of the Crystal Ball function convoluted to the Z->e+e- invariant mass lineshape) after the prompt reconstruction of 2012 data is measured to be 1.0 GeV in the ECAL Barrel**
pdf version  pdf version	***The precision of channel inter-calibration, using energy deposits, as a function of pseudo-rapidity in the ECAL barrel and endcap detectors*** The precision of the combination (weighted average) of the in-situ calibrations from phi-symmetry, from 0 and decays, and from high energy isolated electrons (from W enu decays), as a function of in EB and EE. nb: inter-calibration constants derived before LHC startup (test beam, cosmics, beam splash, and lab measurements) are used in the 2010 combination. The 2011 combination is derived from both in-situ methods using 2011 data and the 2010 constants. **Inter-calibration precision at low eta in EB is ~0.5% and is better than 1% in all eta rings. EE inter-calibration precision is ~2% in the central part of EE and better then 4 % even up to the limit of electron and photon acceptance at = 2.5** These plots are an update of those available in CMS-DP-2012/007



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