# Table of Contents

CASTOR Approved Results

- Results on CASTOR Performance during LHC Run 2
- Jet measurement with the CASTOR calorimeter
- Alignment of CASTOR with 2013 pA TOTEM-Data
- The CMS CASTOR calorimeter detector performance in 2013 data
- CASTOR Detector Performance during the LHC Collision Runs at $\sqrt{s} = 0.9, 2.36$ and $7$
CASTOR Approved Results

Sketch of the CASTOR detector installed around the LHC beam pipe

Results on CASTOR Performance during LHC Run 2

- CMS-DP-2016-006
- Abstract: Results on various aspects of the performance of the CASTOR calorimeter in LHC Run 2 are presented. This includes the alignment, calibration and triggers of the detector. The intercalibration of the gains of the fine mesh PMT's using beam-halo muons is discussed, this in combination with results of a study on the noise and baseline. Two methods on obtaining gain correction factors for reweighing the gains between different high voltage settings are compared. Results on the efficiency of a CASTOR jet trigger are compared for LHC Run 2 collision data and Monte Carlo event generator predictions.

Jet measurement with the CASTOR calorimeter

- CMS-DP-2014-022
- Abstract: The measurement of low pT (>3 GeV) very forward (\(\eta = 6\)) jets with the CASTOR calorimeter of the CMS experiment is presented. The CASTOR (Centauro And STrange Objects Research) calorimeter is covering the pseudorapidity range \(-6.6 < \eta < -5.2\) and is located at -14.37 m from the interaction point. This study is based on a very low pile-up sample of proton-proton collisions at a centre-of-mass energy \(\sqrt{s} = 7\) TeV, taken by the CMS experiment during the Commissioning 2010 run period.

Alignment of CASTOR with 2013 pA TOTEM-Data

- CMS-DP-2014-014
- Abstract: The CASTOR very forward calorimeter of CMS is the most forward subdetector for charged particle characterization at LHC. Due to its location within the forward shielding of CMS various specific problems arise. One of them is the precise alignment of the detector with respect to the LHC beam. During the magnet ramp up the CMS forward area, including CASTOR, slightly moves. Thus, only a precise alignment during data taking conditions can provide a reliable
measurement. In this analysis the fact is exploited that in front of CASTOR there is the T2 tracking telescope of the TOTEM collaboration. With the help of online trigger exchange and offline event merging a data set is produced that combines event data including both, the T2 and CASTOR detectors. For this data a dedicated L1 trigger was developed and used, which selects pure electromagnetic isolated clusters in CASTOR gated with a low track multiplicity in T2. These data comprises of isolated electron candidates, which is used for this precise alignment.

The CMS CASTOR calorimeter detector performance in 2013 data

• CMS-DP-2013-035
• Public twiki page
• Abstract: CASTOR has taken data since the beginning of LHC operation in 2009. In 2012 the calorimeter has been upgraded with radiation hard PMTs. Improvements in detector mechanical components and services were also important part of the upgrade program. Right after re-installation in CMS the calorimeter successfully took data in 2013 when LHC was colliding first proton and ion beams (pPb) at the center of mass energy of 5.02 TeV per nucleon and then pp beams at the center of mass energy of 2.76 TeV. A set of performance plots, as obtained using reconstructed calorimeter signals in pPb and pp collision events, are presented here. CASTOR response correlation with other CMS sub-detectors (tracker, HF, ZDC) is discussed.

CASTOR Detector Performance during the LHC Collision Runs at $\sqrt{s} = 0.9$, 2.36 and 7

• CMS-DP-2010-037
• Abstract: Basic performance plots for the CASTOR calorimeter are provided on the signal timing, the effect of the CMS solenoid field on the PMT response, the description of the longitudinal shower profile and pi/e response in test beam data by Monte Carlo simulation and the total collected charge in pp collisions at $\sqrt{s} = 0.9$, 2.36 and 7 TeV.