

# Results of CMS Test Beam 2006 for G4 10.3.ref09

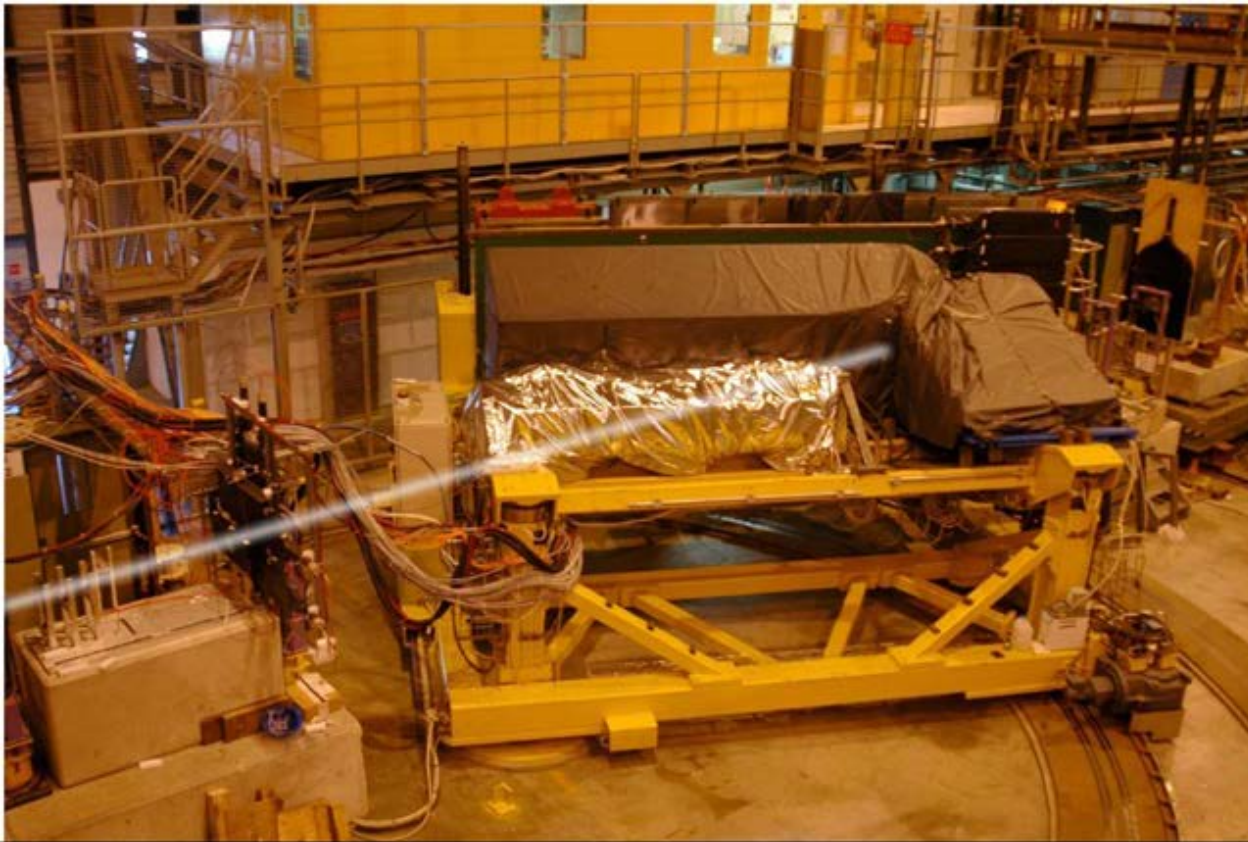
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# Geant4 testing status in CMSSW

- Geant4 reference tags are integrated inside CMSSW in the ROOT6 branch
  - We switch from 10.4beta -> 10.3ref08 -> 10.3ref09
  - Went smoothly after 1st switch, no modifications in CMSSW were required
- DEVEL branch is updated from 10.3p01 to 10.3p02
- Recent results are obtained for TB 2006:
  - CMSSW\_9\_4\_0\_pre2 – Geant4 10.2p02
  - CMSSW\_9\_3\_DEVEL\_X\_2017-10-08-2300 – Geant4 10.3p02
  - CMSSW\_9\_3\_ROOT6\_X\_2017-08-16-2300 – Geant4 10.4beta
  - CMSSW\_9\_4\_ROOT6\_X\_2017-10-06-2300 – Geant4 10.3ref09
  - Only for FTFP\_BERT\_EMM (CMS default) Physics List

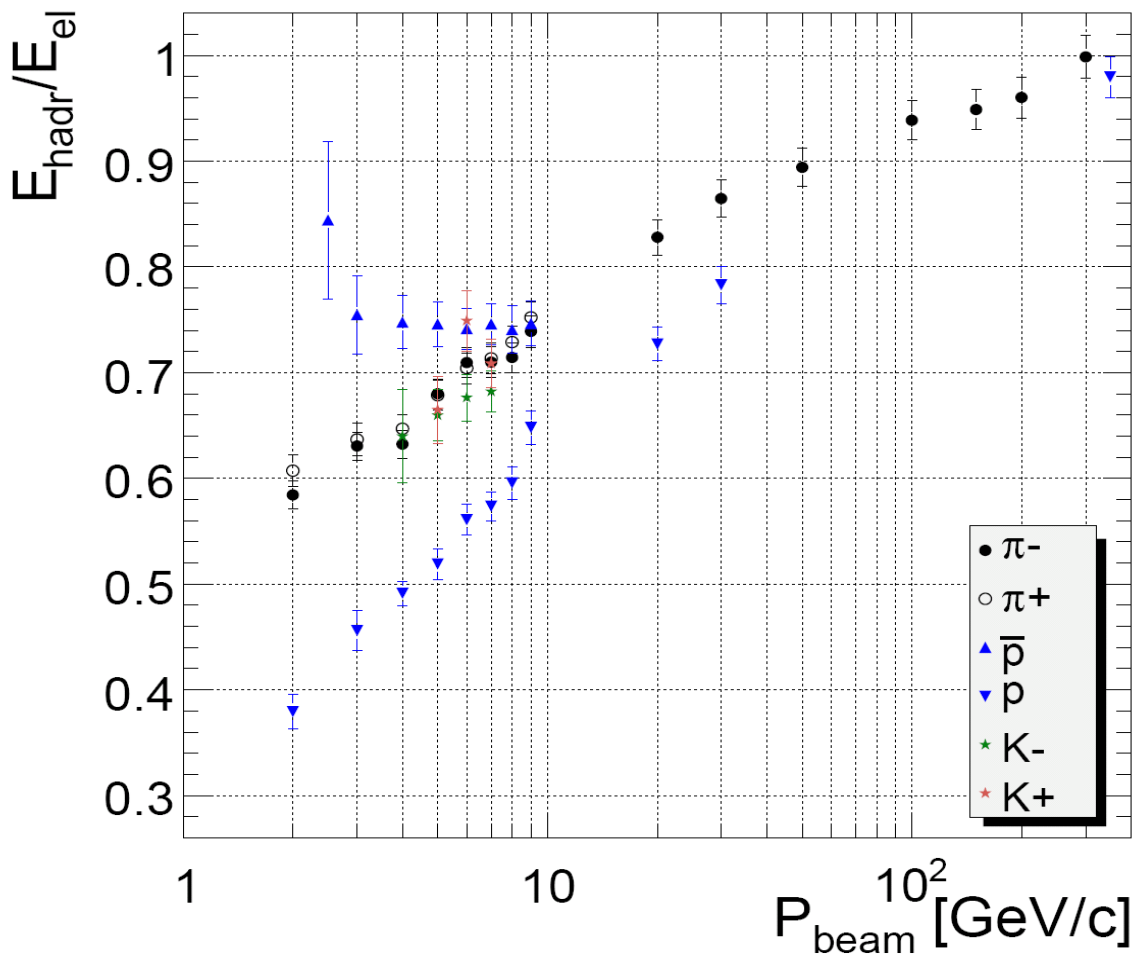


# Combined calorimeter test-beam 2006

Serguei Bytukov (IHEP), Vladimir Ivanchenko (CERN),  
Sunanda Banerjee (FNAL) reported at CHEP'2016

# 2006 TestBeam Data

- CMS Notes 2008/025, 2008/034, 2010/007
- CMS collected data with prototype of barrel HCAL and barrel ECAL super-module in the H2 test beam area at CERN during 2006.
  - Special action was taken to go down to 1 GeV hadron beam
  - Beam particle identification from Cherenkov and TOF detectors
- Measured mean energy deposition, width and energy fractions in ECAL and HCAL



# Summary



- **Mean energy deposition**
  - Stable results in general
  - For pions and protons results are practically unchanged
  - Visible degradation for pbar for both 10.3 and 10.4
  - A tiny degradation for kaons
- **Resolution**
  - Below 5 GeV simulation underestimates resolutions
  - Results are stable
- **CMS conclusion for Geant4 10.4**
  - Except some degradation of results for pbar, 10.2, 10.3 and 10.4 are equivalent
  - 10.4beta and 10.4ref09 are fully equivalent for this test
  - For CMS the best possible robustness of FTFP\_BERT in 10.4 is needed