



# EM physics validation results for Geant4 11.2ref02

V. Ivantchenko

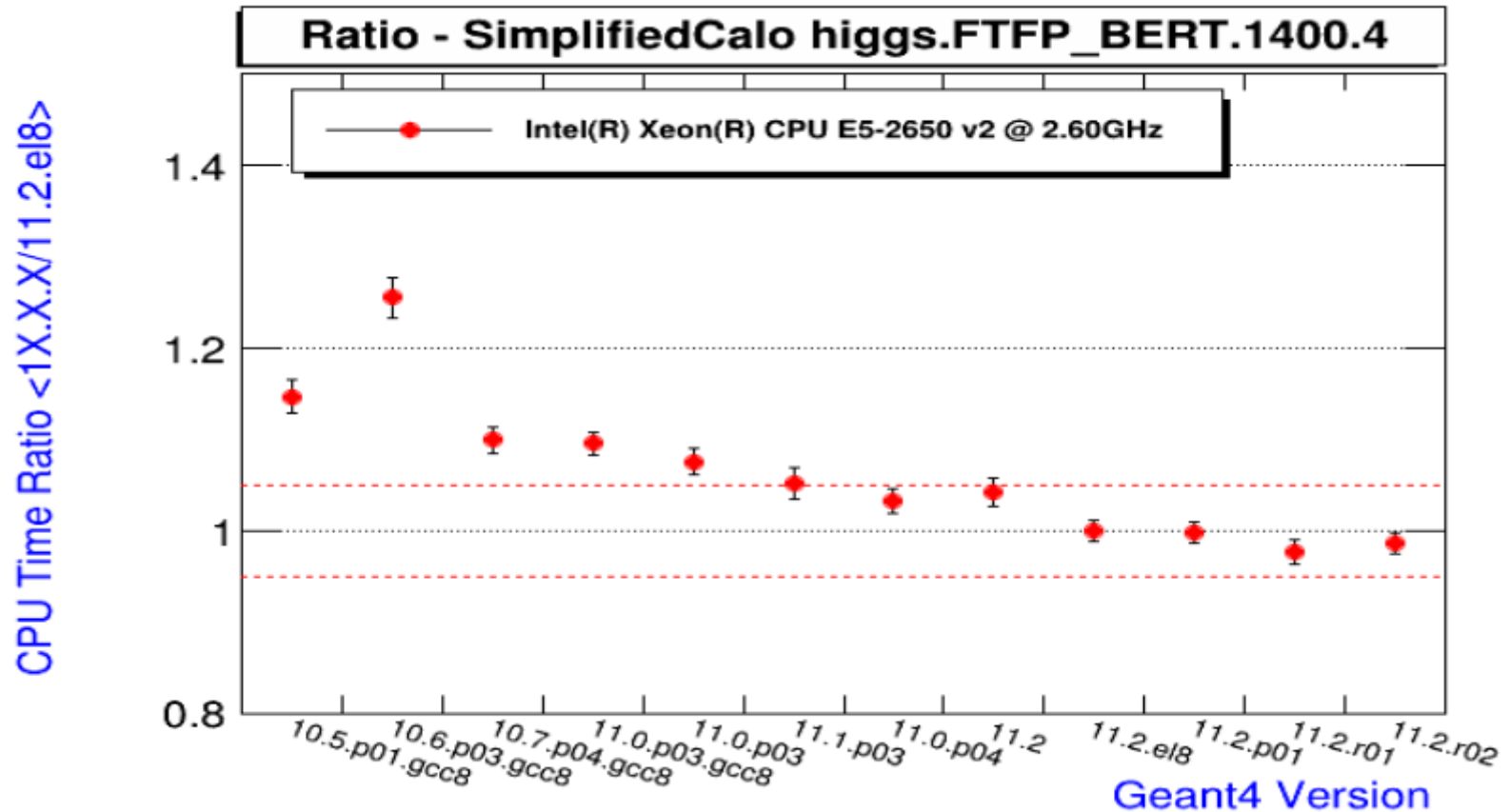
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# Modifications in EM for 11.2ref02

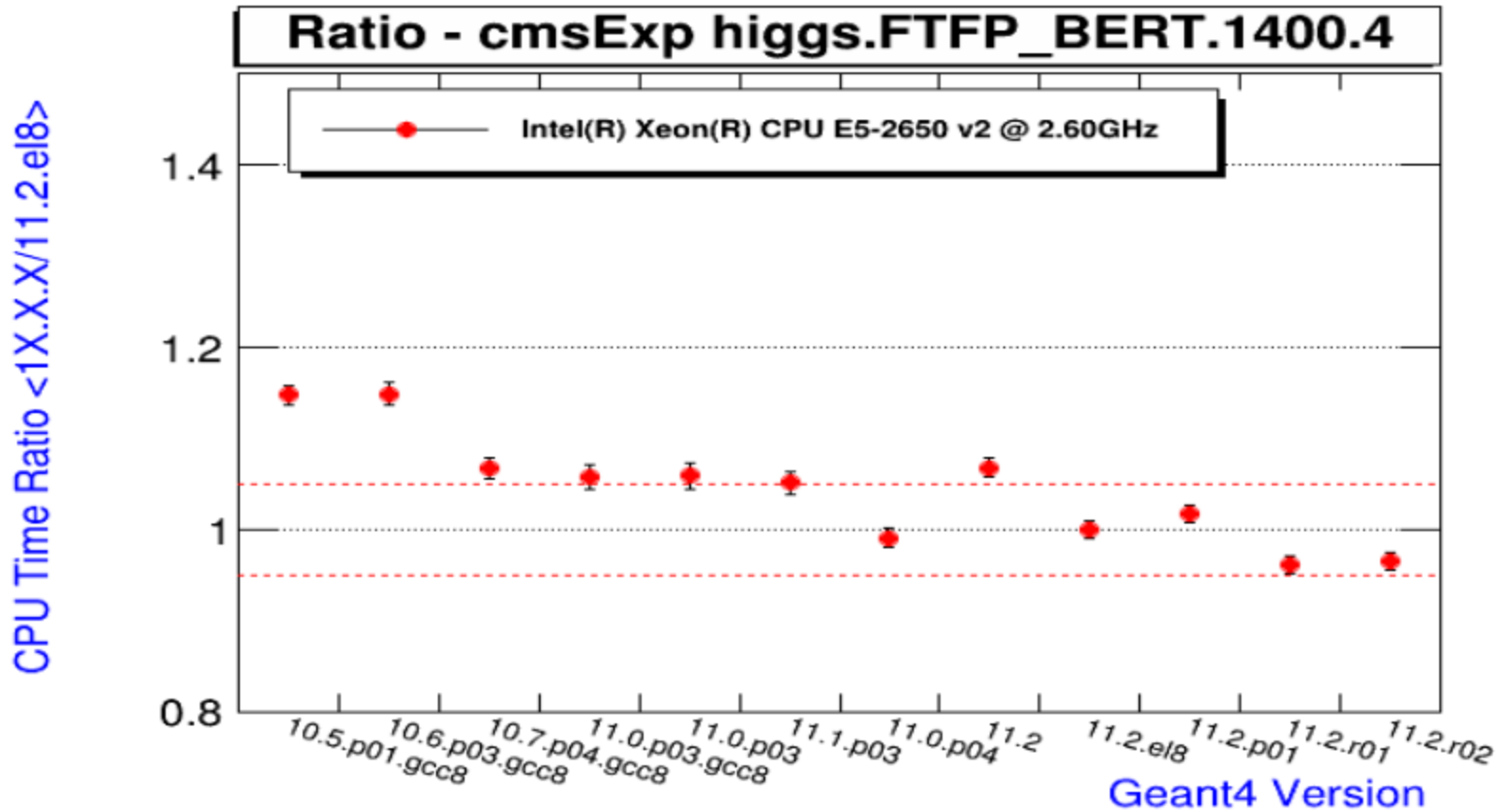
- **## 2024-02-20 V.Ivanchenko (emstand-V11-02-03)**
  - G4eeToTwoGammaModel - fixed precision lost in sampling of final state for the very high energy (ATLAS report)
- **## 2024-02-06 V.Ivanchenko (emstand-V11-02-02)**
  - G4IonFluctuations - disable previous MR - return to 11.2 version
- **## 2024-02-29 Hoang Tran (emdna-V11-02-02)**
  - correct verbose conditions for warning in IRT-syn model
- **## 2024-02-24 Hoang Tran (emdna-V11-02-01)**
  - Optimize IRT-syn at 1 ps for high LET applications
- **## 2024-02-07 Vladimir Ivanchenko (phys-ctor-em-V11-02-02)**
  - G4EmStandardPhysics\_option3 - return back step limit type to fUseDistanceToBoundary and the default RangeFactor 0.04 from 0.03, which will allow to restore more accurate distributions for several tests for medical benchmark
- **## 2024-02-04 Vladimir Ivanchenko (phys-ctor-em-V11-02-01)**
  - G4GammaGeneralProcess - fixed sampling of muon pair production - problem 2543

# FNAL Geant4 Profiling (J. Yarba)



11.2.1 is the same as 11.1 and 11.2, 5% speed-up come from el8

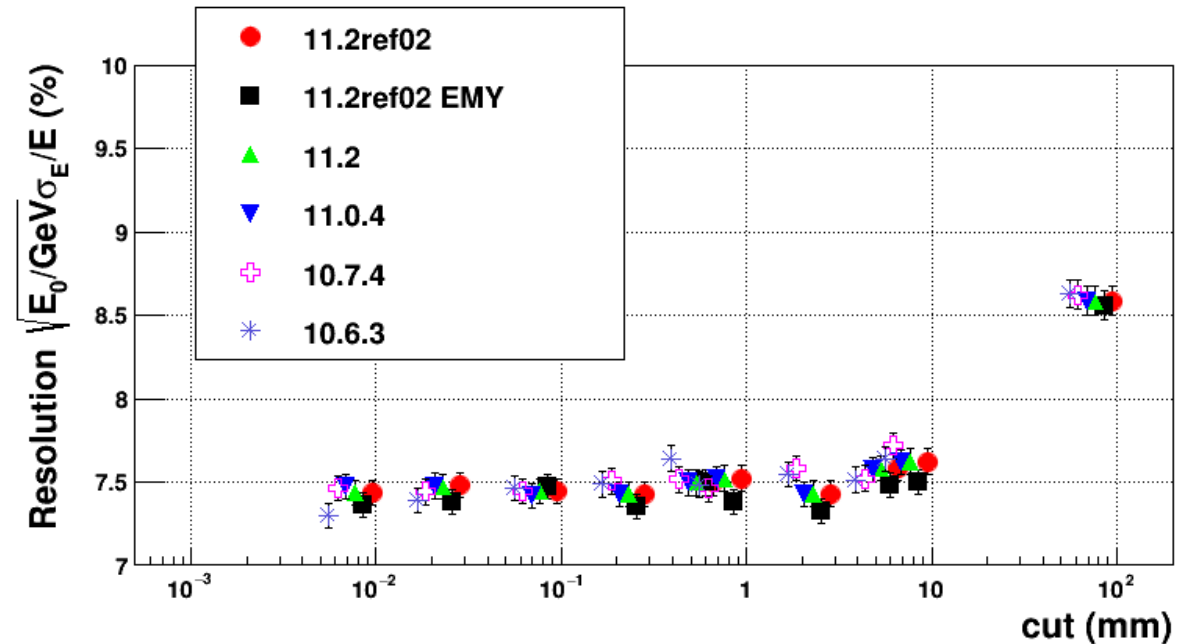
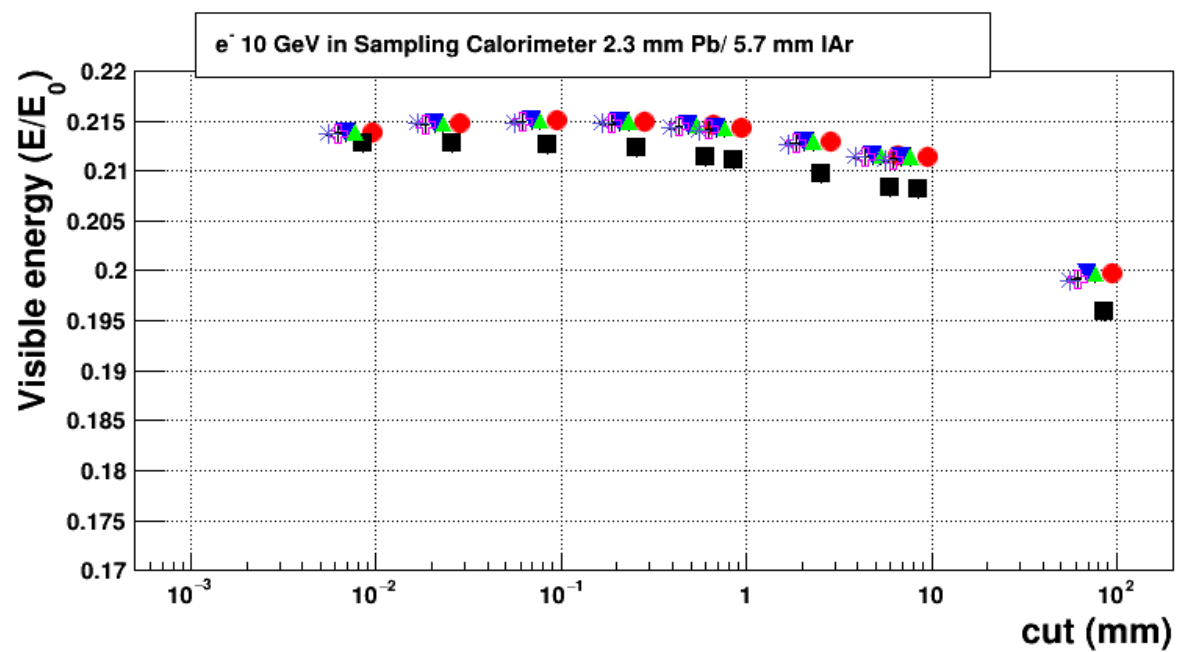
# FNAL Geant4 Profiling (J. Yarba)



11.2.1 is the same as 11.1 and 11.2, 5% speed-up come from el8  
The reason for ref-01 and ref-02 be faster than 11.2.1 is not clear

# Simplified ATLAS barrel

- ❖ EM Opt3 physics fDistanceToBoundary step limitation is used
- ❖ Results are the same as in Geant4 11.2.1



# Test Results

- Testing results will be available:
  - <https://test-geant4-tools.web.cern.ch/test-geant4-tools/emtesting/>
- In general, EM results are stable since 11.1.X
  - It is not expected a significant change in LHC simulations
  - The effect of fixes “for speed-up” is not seen
- Migrations of EM tests are in progress
  - Migration from python-2 to python-3 nearly done (A. Bagulia)