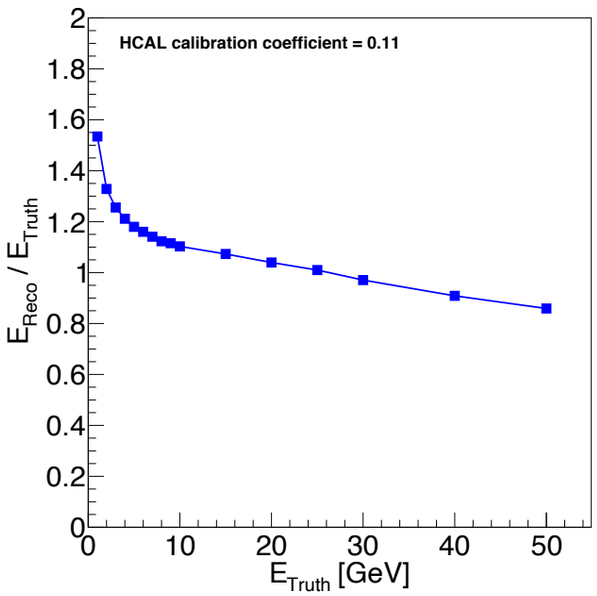
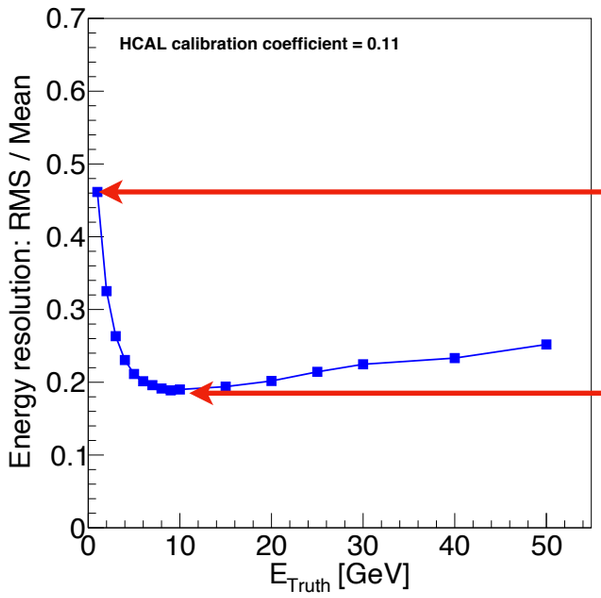
Geometry:

- **SDHCAL only**
- **Si-W ECAL + SDHCAL**
  - **ECAL calibration coefficients**
    - **48.16 for first 20 layers**
    - **96.32 for later 10 layers**
  - **HCAL calibration**
    - **set energy of each hit as a constant, total energy proportional to the hit number -> digital mode**
  - **Longitudinal thickness: 24 X0**
- **Crystal ECAL + SDHCAL**
  - **Longitudinal thickness: 24 X0**
  - **ECAL calibration coefficient = 1**
  - **HCAL calibration: as above**

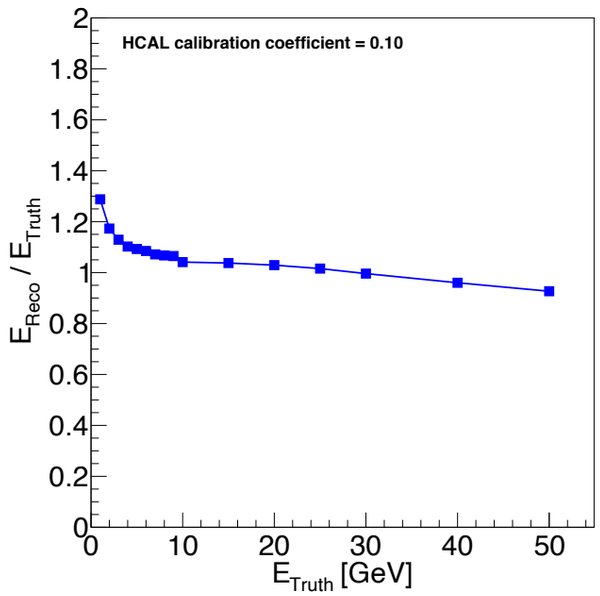
	W	BGO	PWO	BaF2	CsI	LYSO
X0 (mm)	3.5	11.2	8.9	20.3	18.6	11.4
λI (mm)	99	228	207	307	393	209
24X0 -> nλ	0.85	1.18	1.03	1.59	1.14	1.31

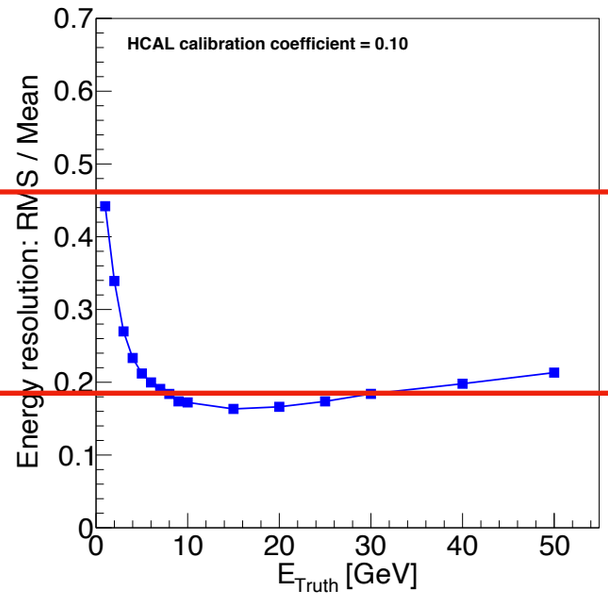
SDHCAL only



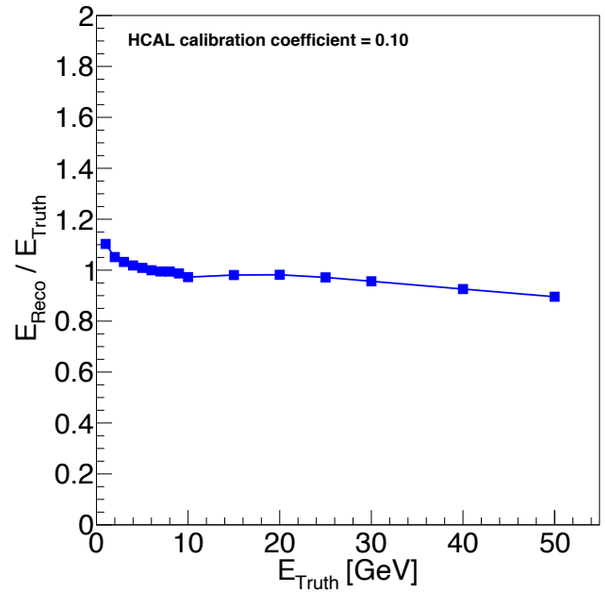


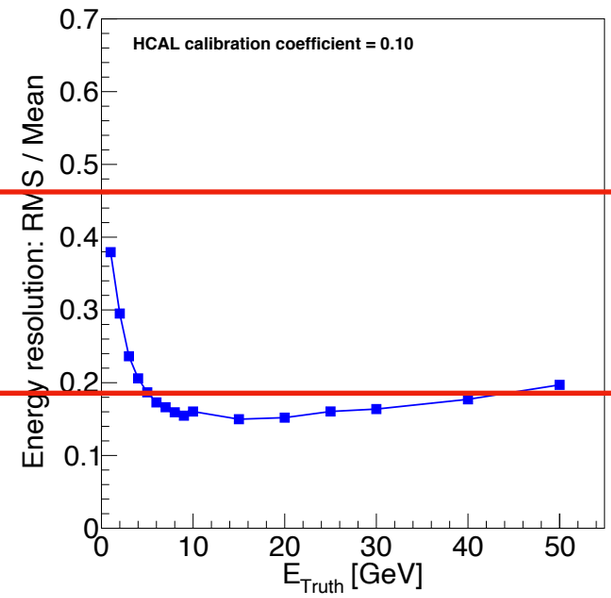
Si-W ECAL + SDHCAL



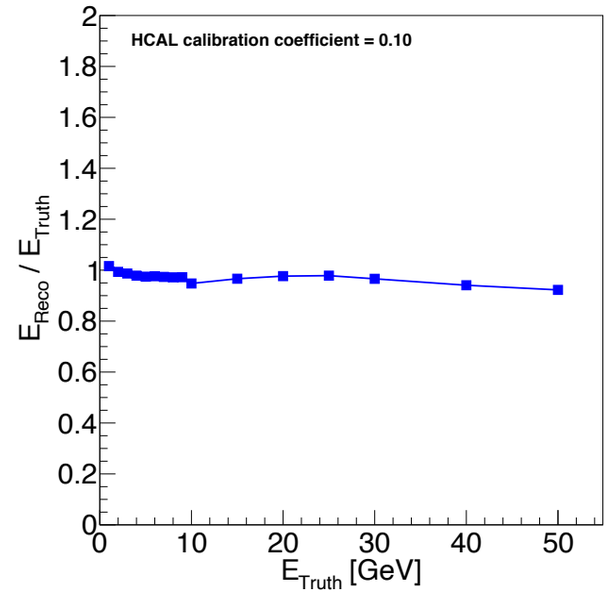


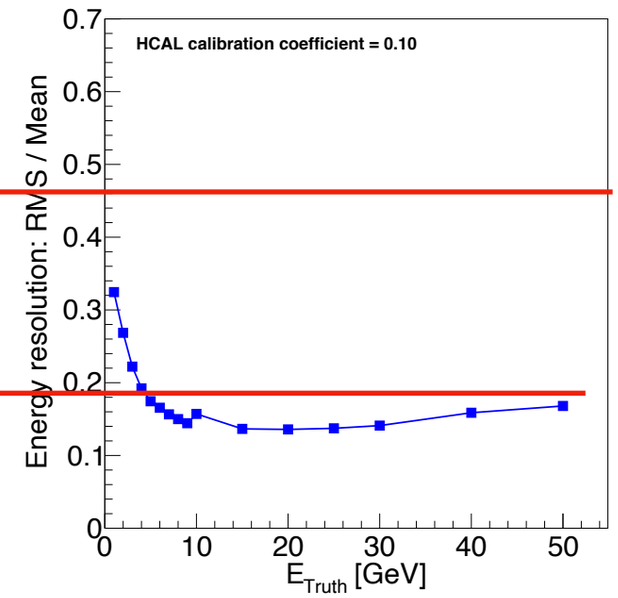
PWO





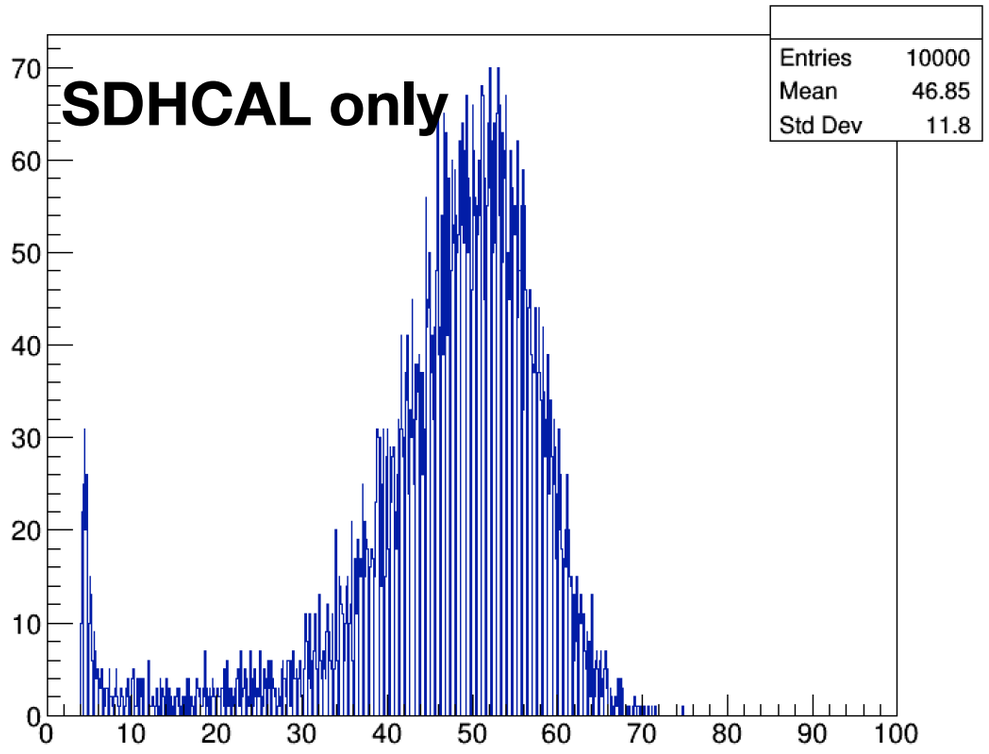
BaF2

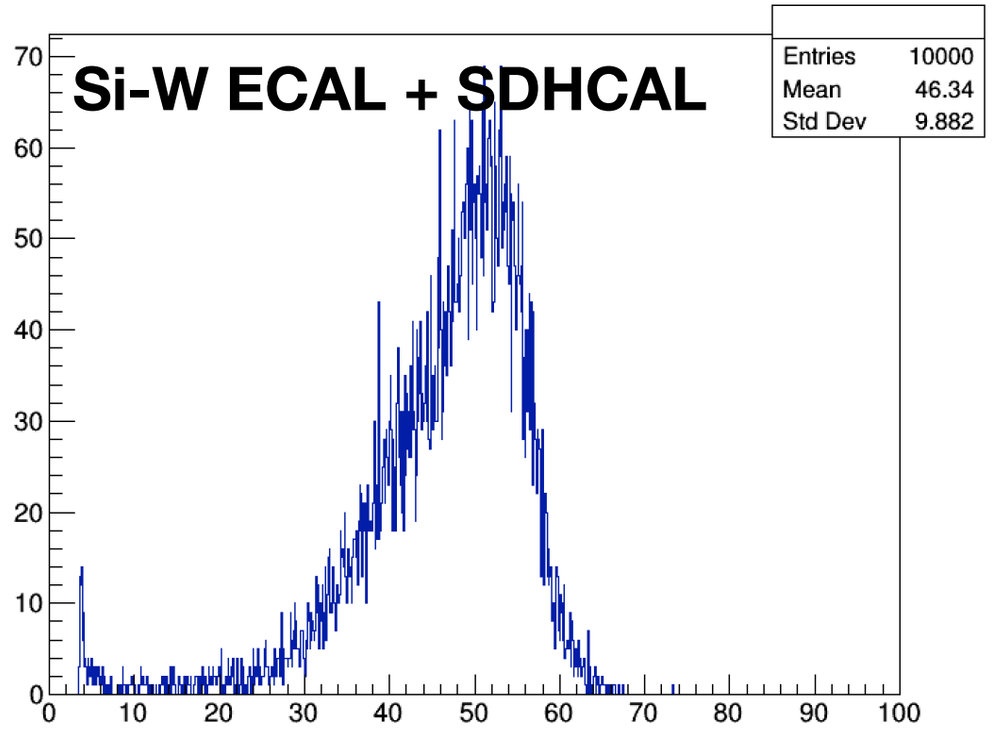


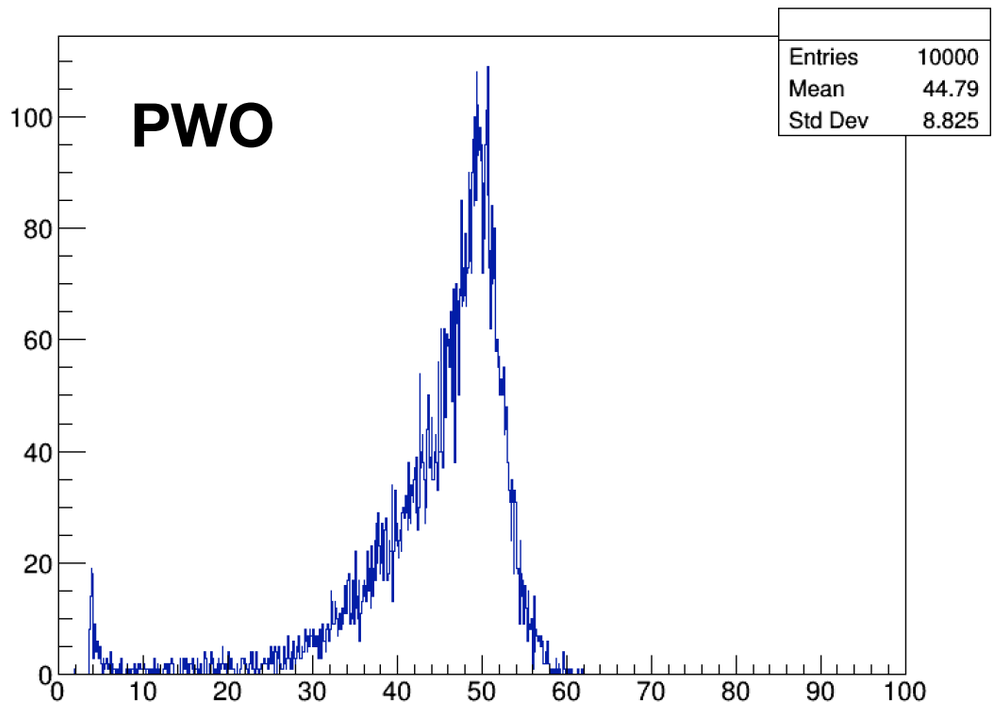


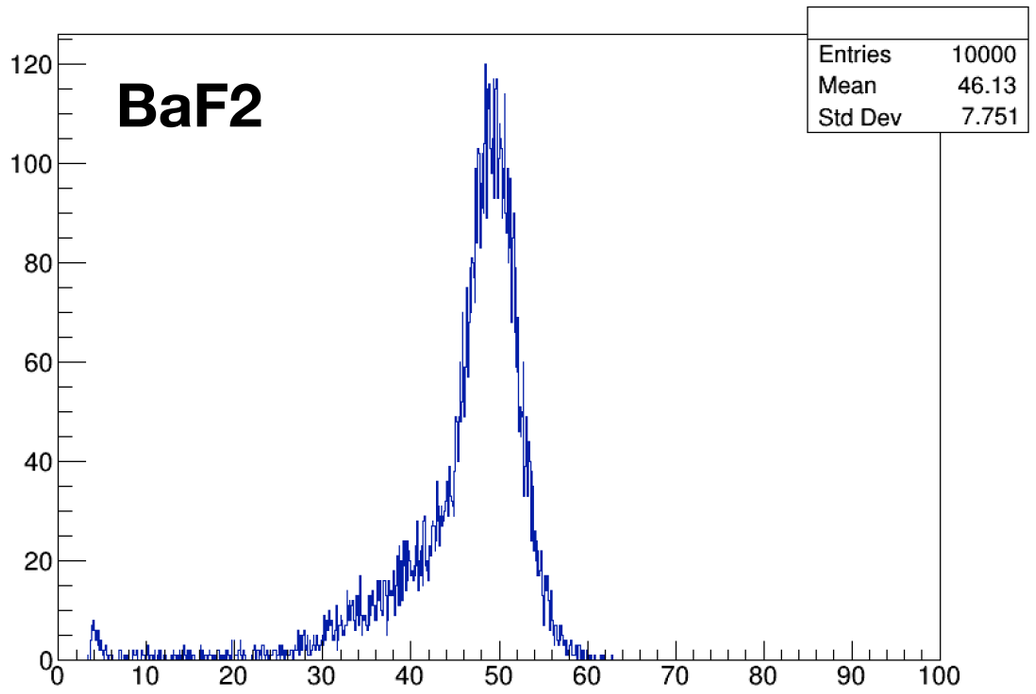
	W	BGO	PWO	BaF2	CsI	LYSO
X0 (mm)	3.5	11.2	8.9	20.3	18.6	11.4
λI (mm)	99	228	207	307	393	209
24X0 -> nλ	0.85	1.18	1.03	1.59	1.14	1.31

50GeV

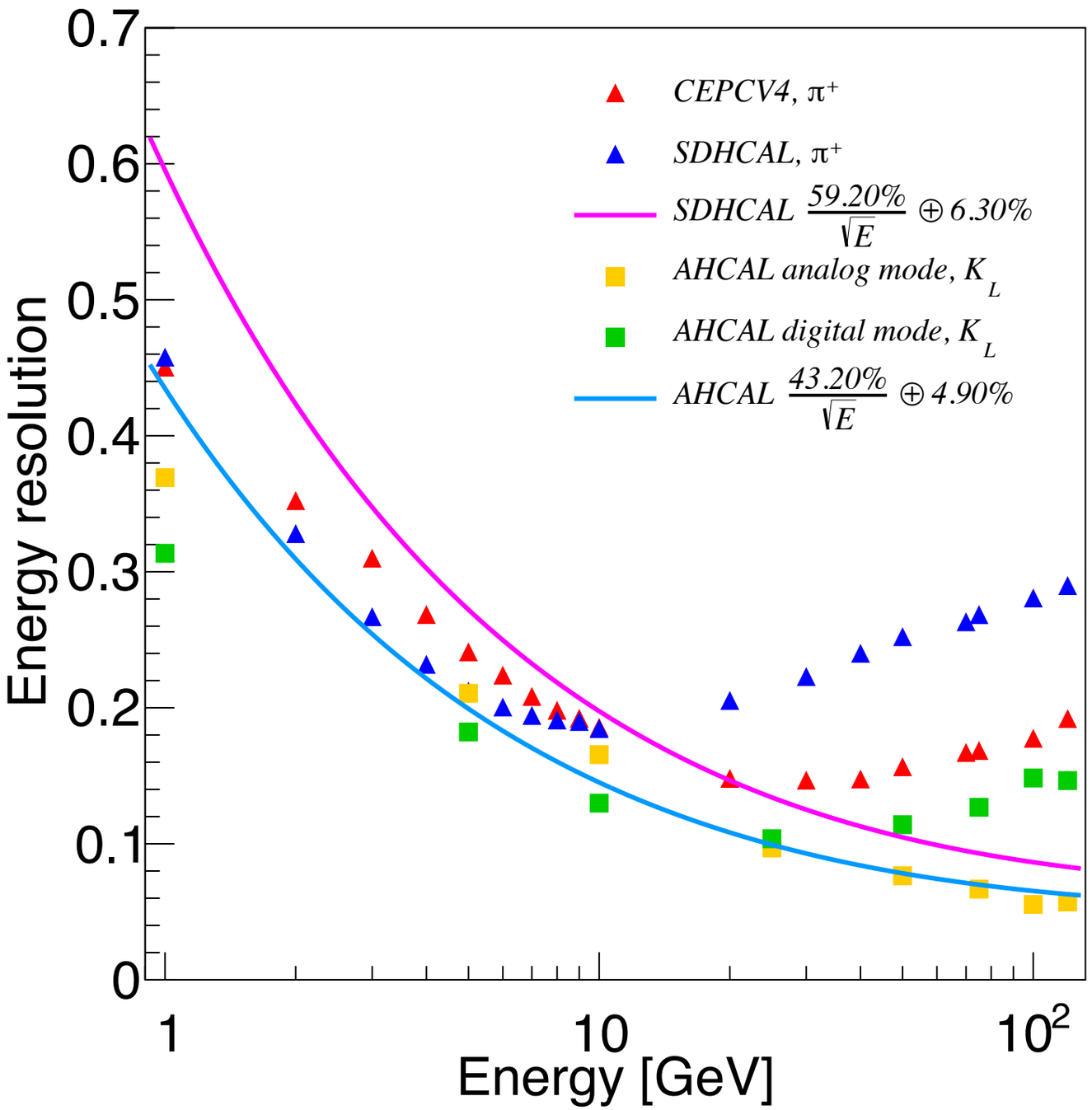

SDHCAL only
Entries 10000
Mean 46.85
Std Dev 11.8


Si-W ECAL + SDHCAL
Entries 10000
Mean 46.34
Std Dev 9.882


PWO
Entries 10000
Mean 44.79
Std Dev 8.825

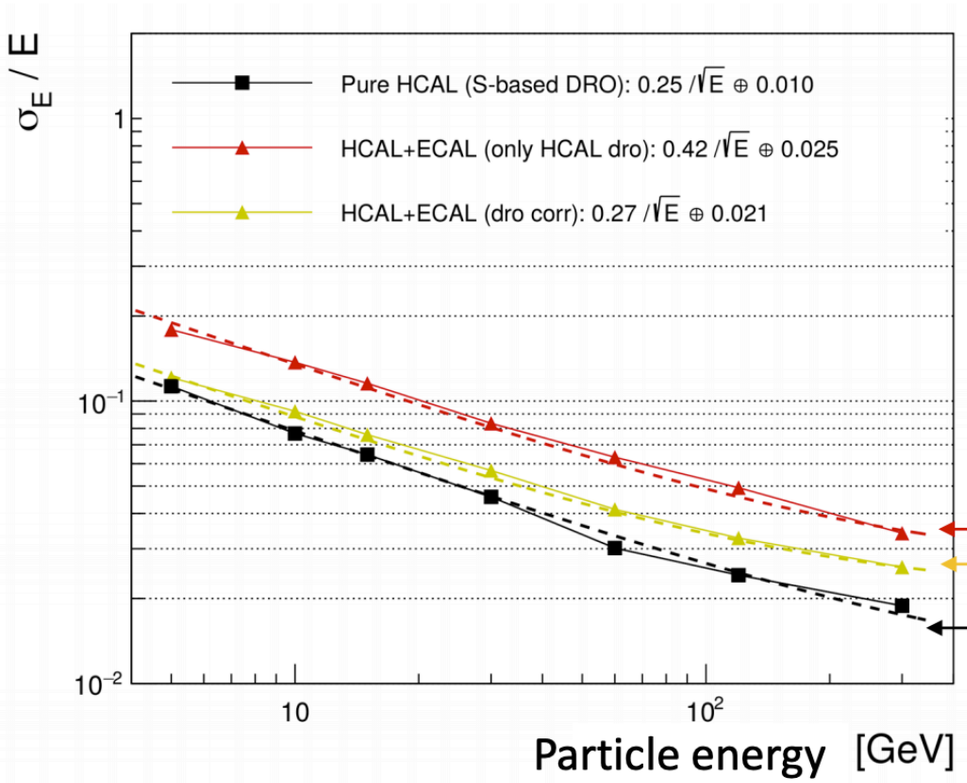

BaF2
Entries 10000
Mean 46.13
Std Dev 7.751

HCAL Resolution



Hadronic resolution

1. Correct the energy deposit in the HCAL with DRO
2. Correct the energy deposit in the back section of the ECAL with DRO
3. Calibrated sum of ECAL+HCAL



~27%/√E ⊕ 2%

Good stochastic term recovered with ECAL Dual Readout!

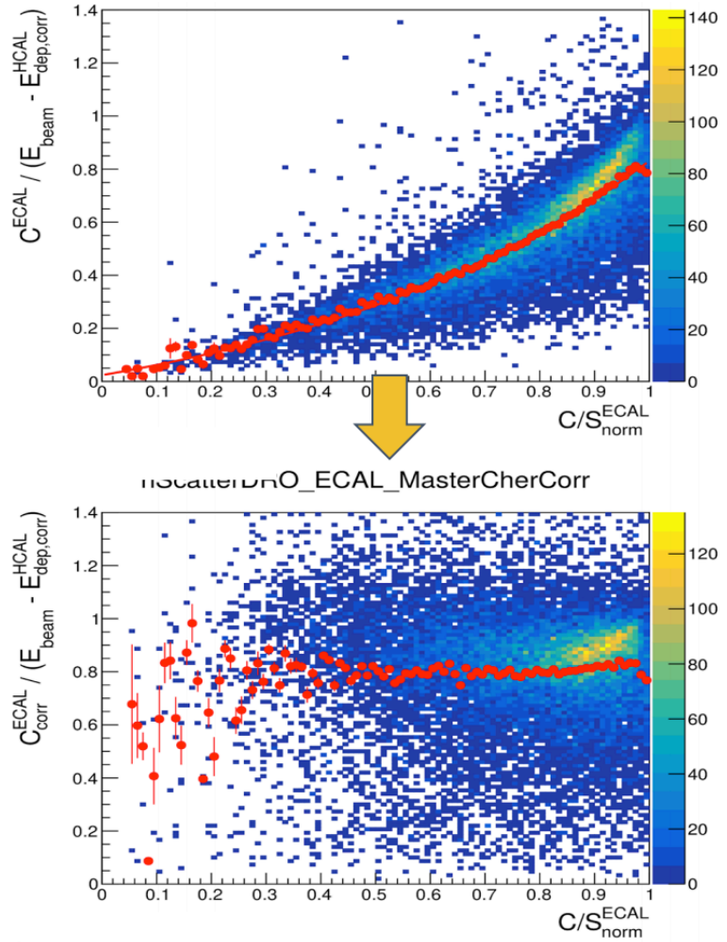
adding raw ECAL energy

adding DRO corr ECAL

pure HCAL

DRO correction for the energy deposit in the ECAL

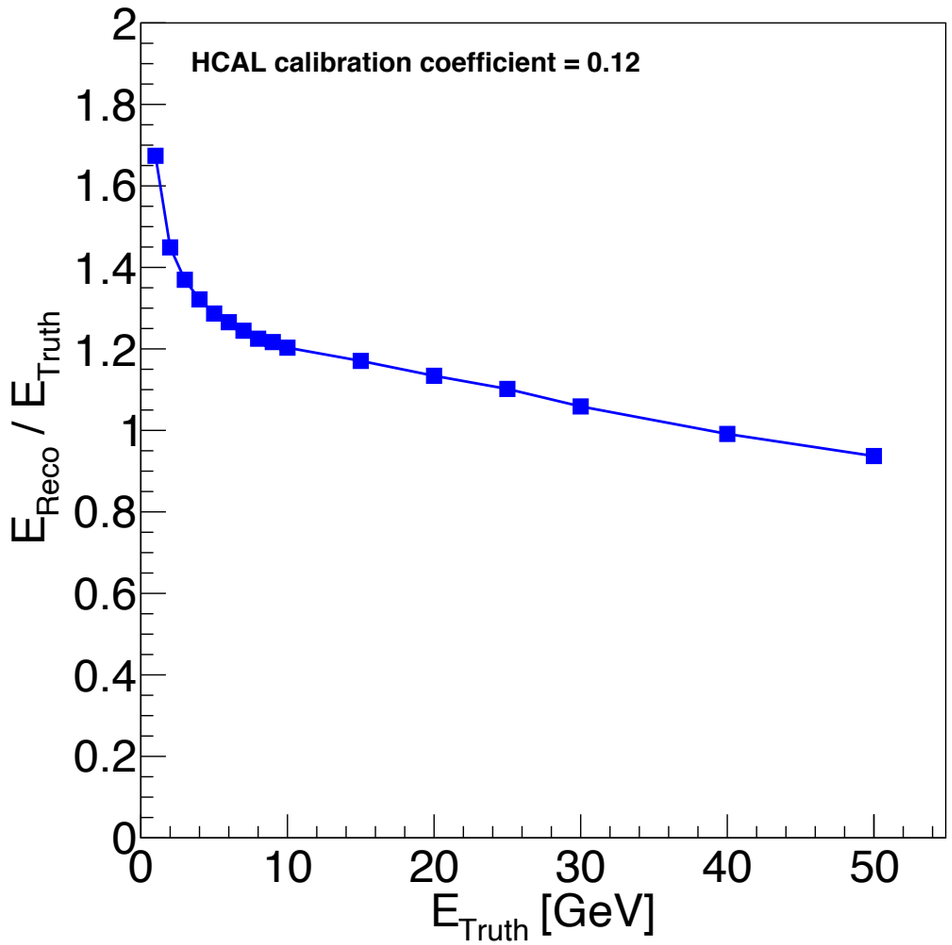
before correction

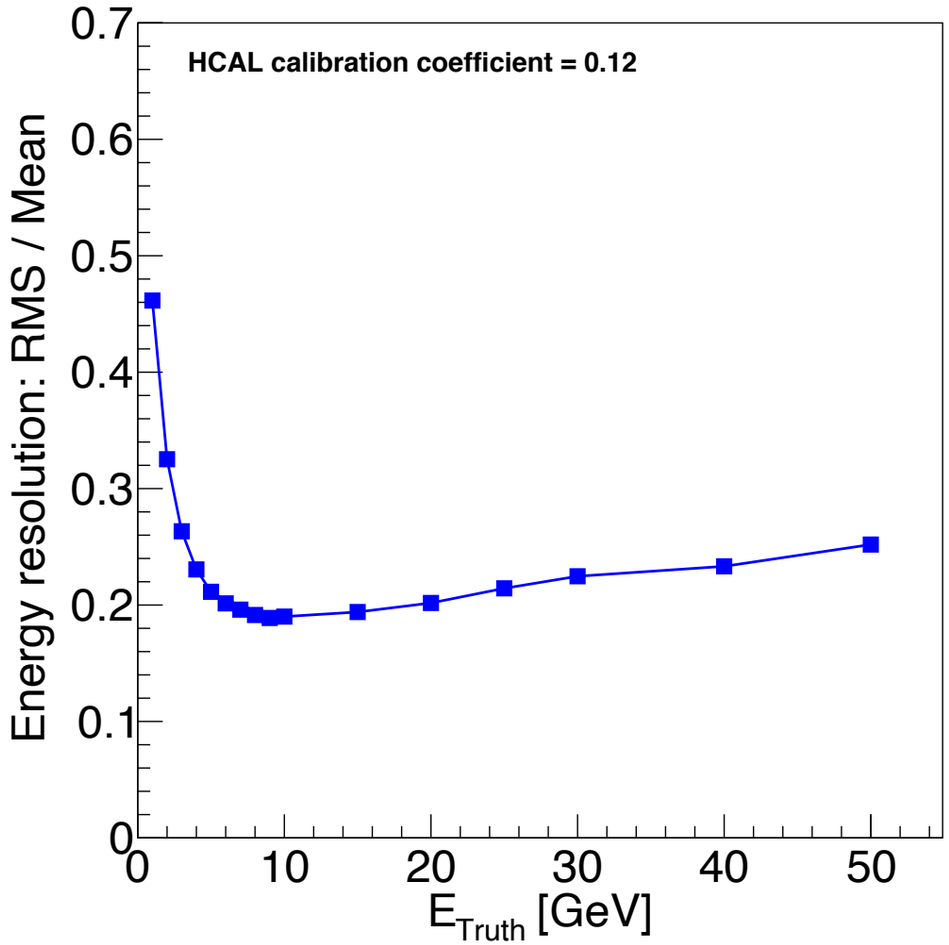


after correction

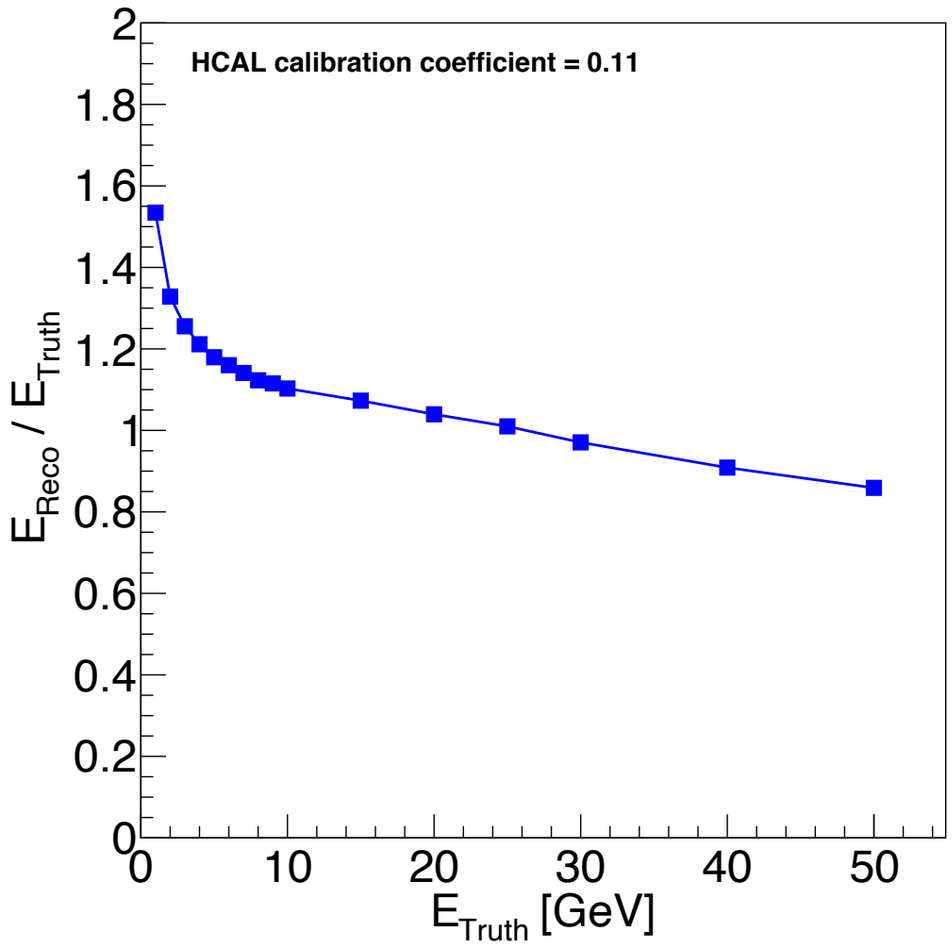
https://indico.ihep.ac.cn/event/11444/session/8/contribution/134/material/slides/0.pdf

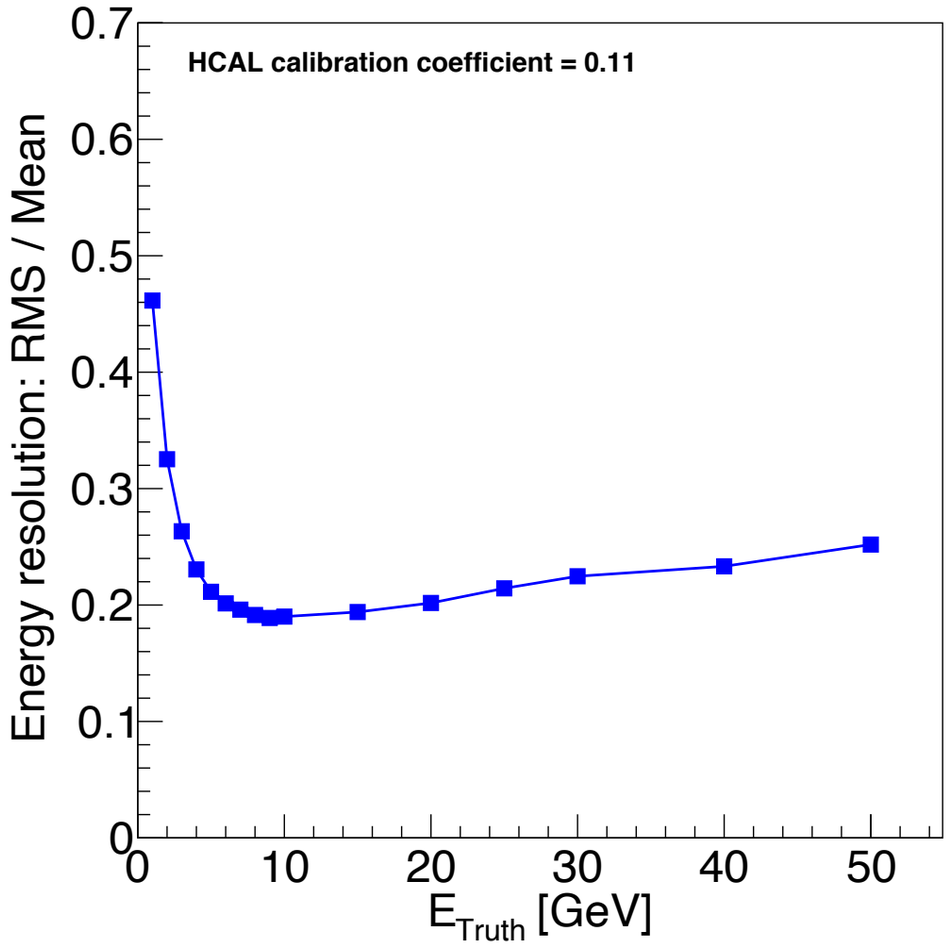
SDHCAL only


HCAL calibration coefficient = 0.12
E_{Reco} / E_{Truth}
E_{Truth} [GeV]
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
0
10
20
30
40
50

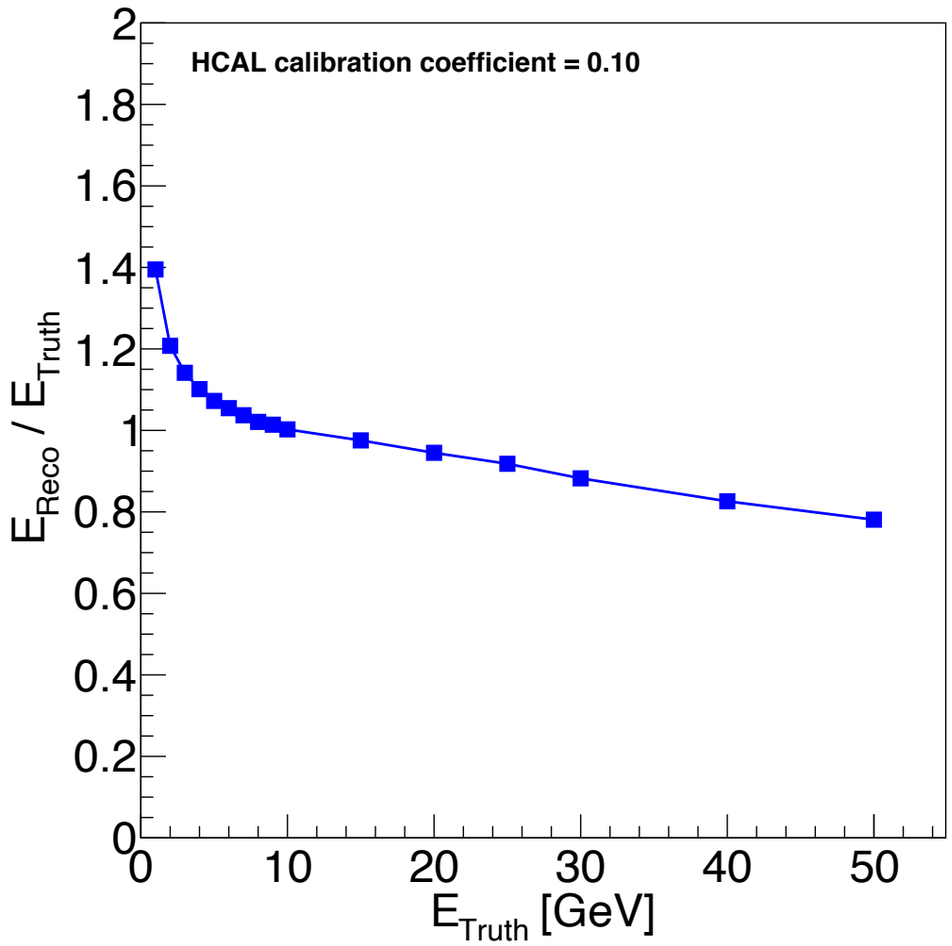

HCAL calibration coefficient = 0.12
Energy resolution: RMS / Mean
E_{Truth} [GeV]
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0
10
20
30
40
50

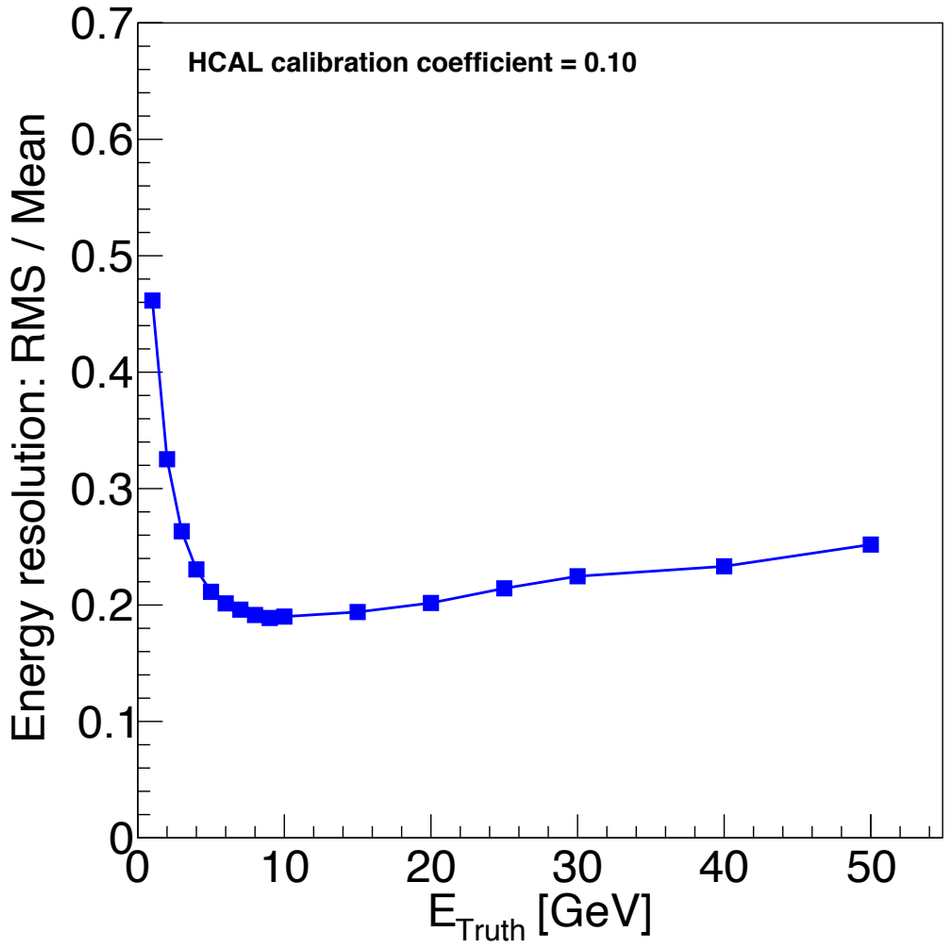
SDHCAL only


HCAL calibration coefficient = 0.11
E_{Reco} / E_{Truth}
E_{Truth} [GeV]
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
0
10
20
30
40
50

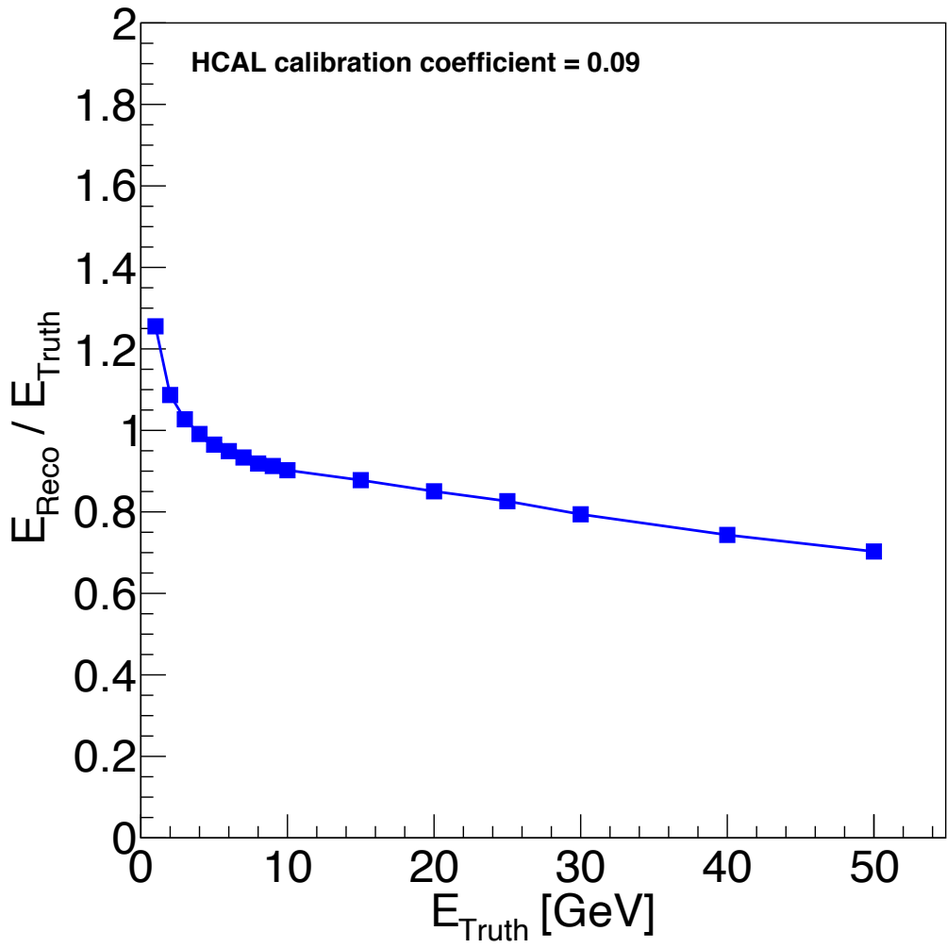

HCAL calibration coefficient = 0.11
Energy resolution: RMS / Mean
E_{Truth} [GeV]
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0
10
20
30
40
50

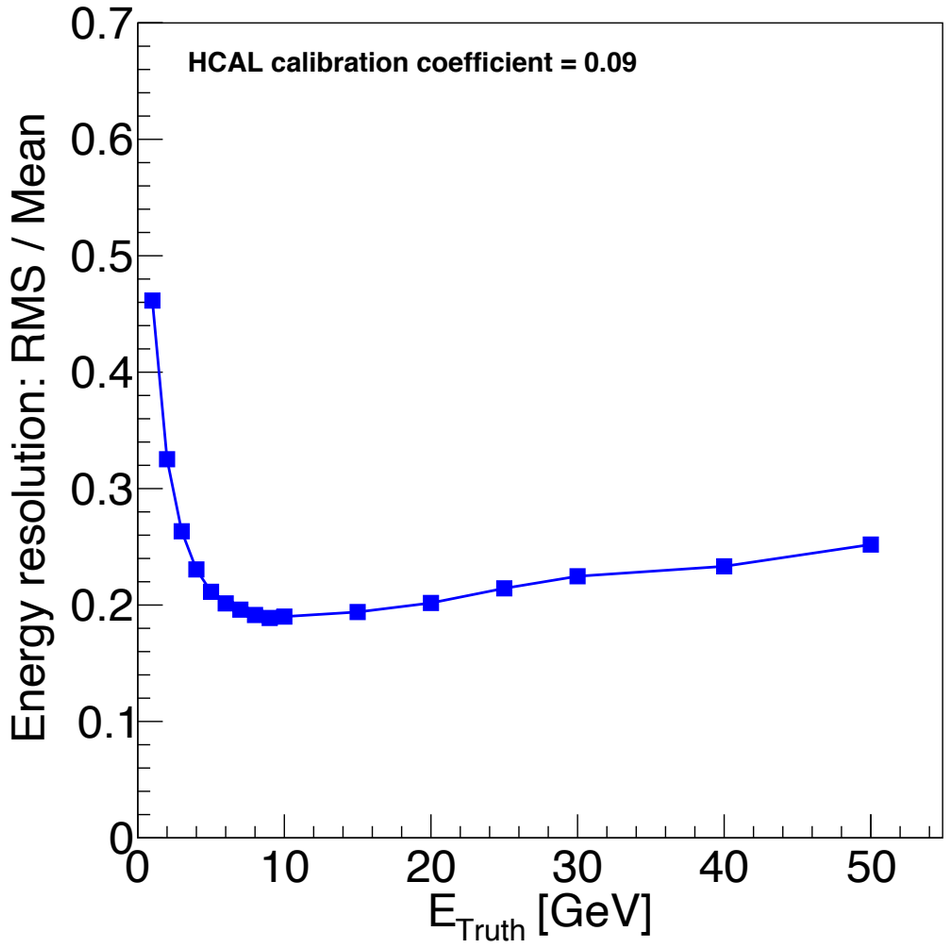
SDHCAL only


HCAL calibration coefficient = 0.10
E_{Reco} / E_{Truth}
E_{Truth} [GeV]
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
0
10
20
30
40
50

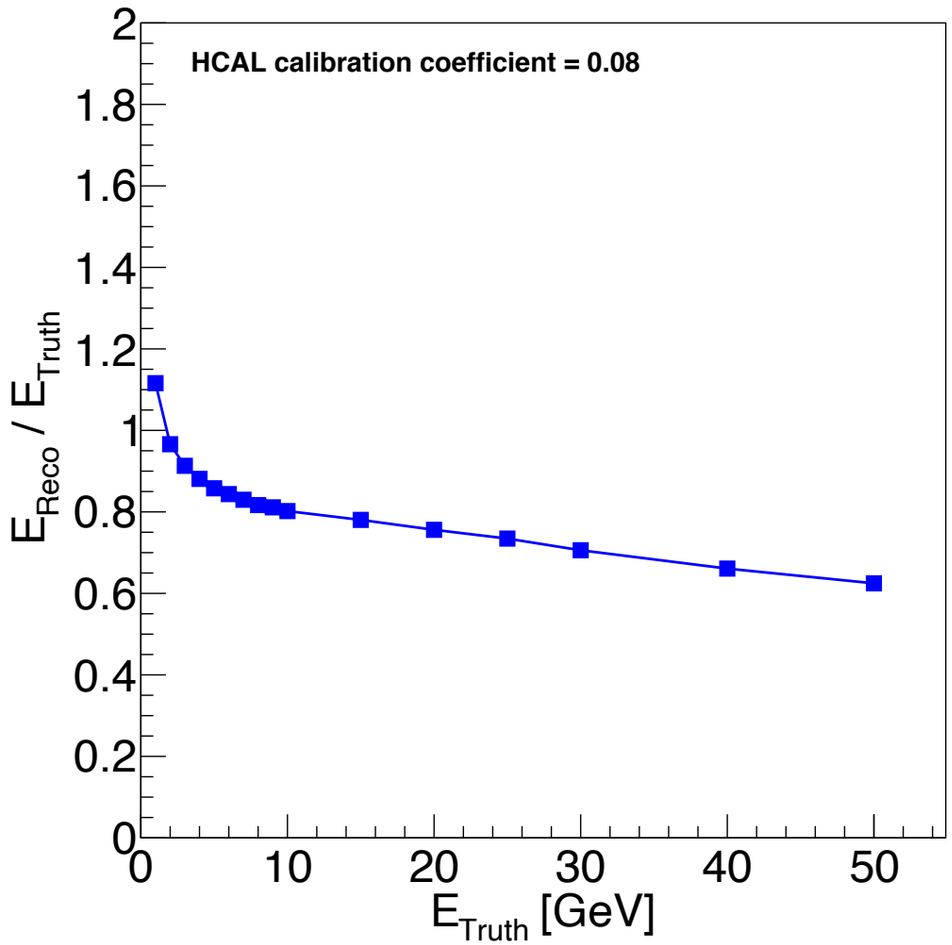

HCAL calibration coefficient = 0.10
Energy resolution: RMS / Mean
E_{Truth} [GeV]
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0
10
20
30
40
50

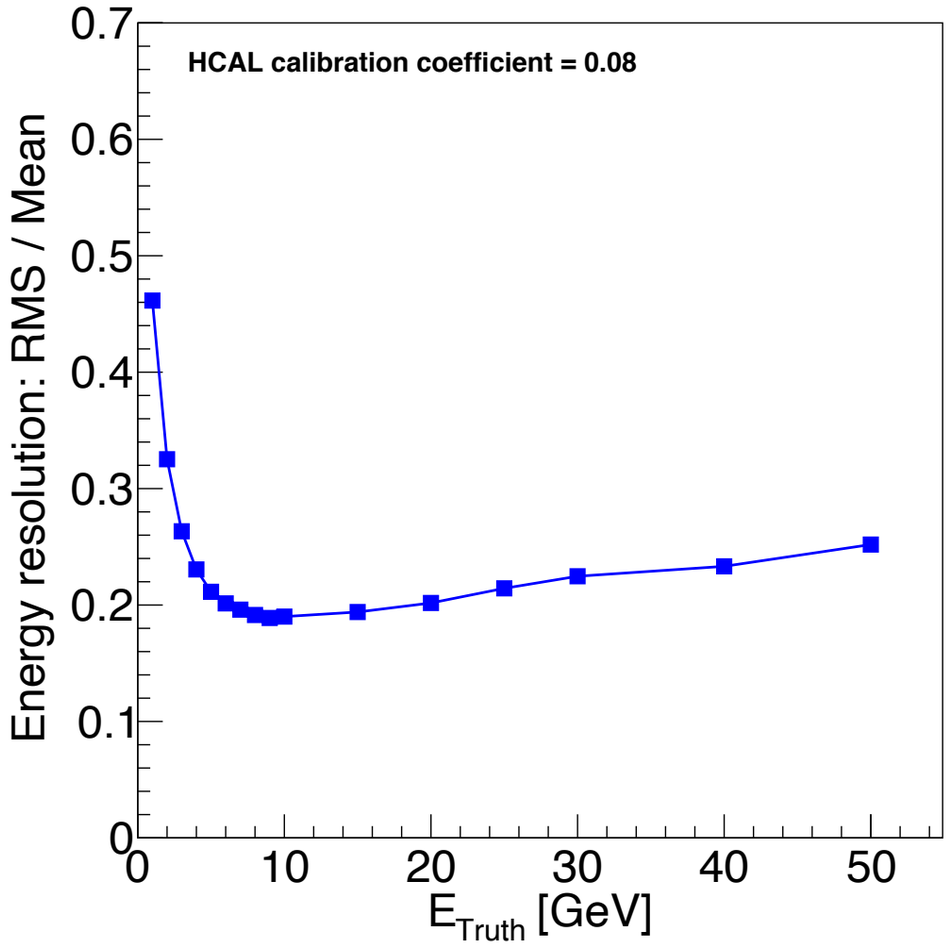
SDHCAL only


HCAL calibration coefficient = 0.09
E_{Reco} / E_{Truth}
E_{Truth} [GeV]
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
0
10
20
30
40
50

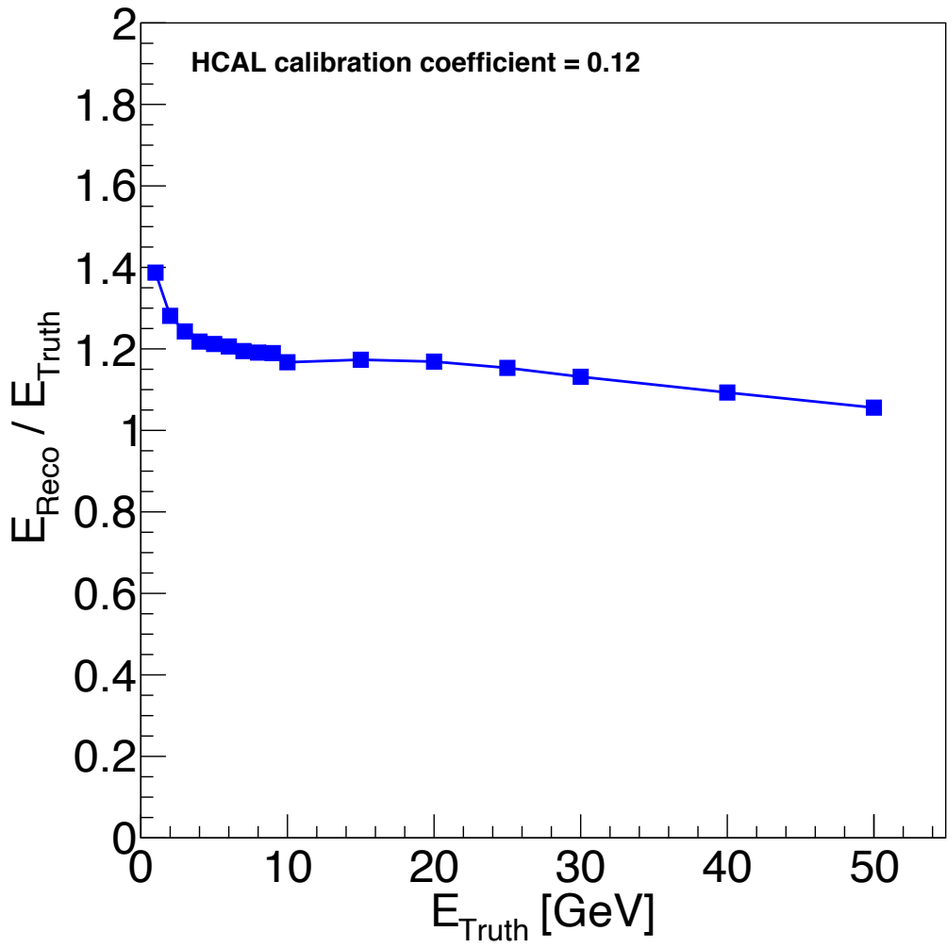

HCAL calibration coefficient = 0.09
Energy resolution: RMS / Mean
E_{Truth} [GeV]
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0
10
20
30
40
50

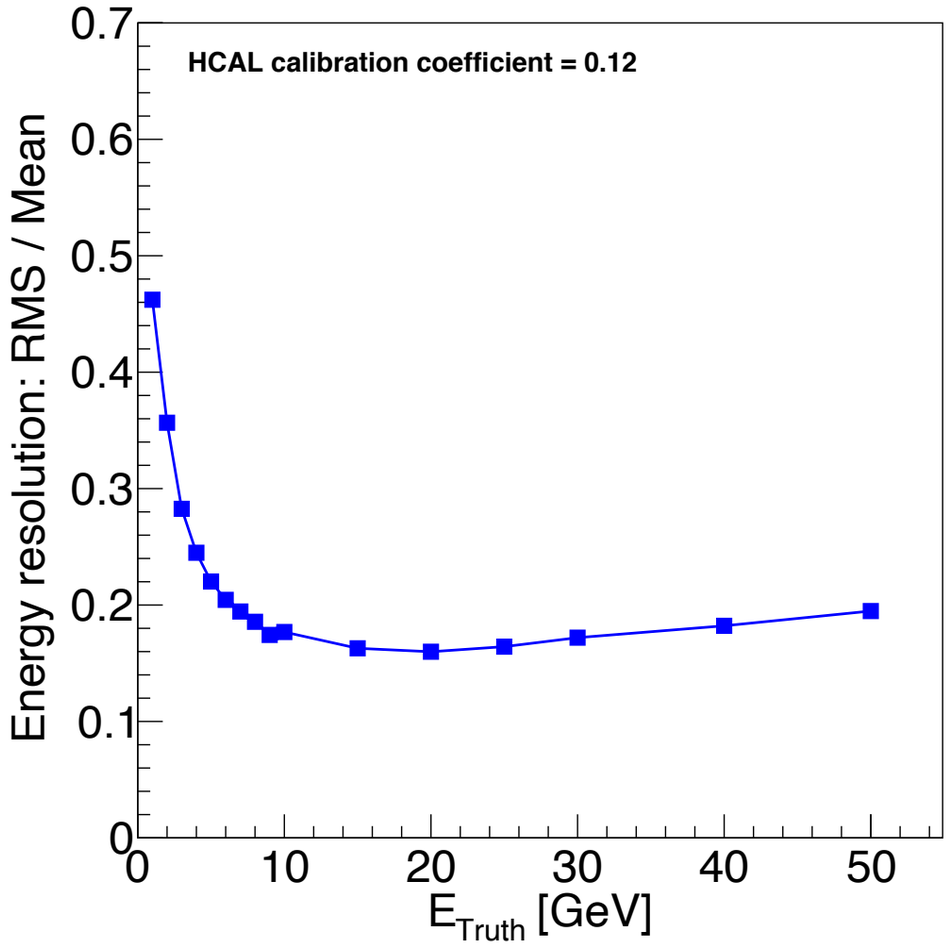
SDHCAL only


HCAL calibration coefficient = 0.08
E_{Reco} / E_{Truth}
E_{Truth} [GeV]
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
0
10
20
30
40
50

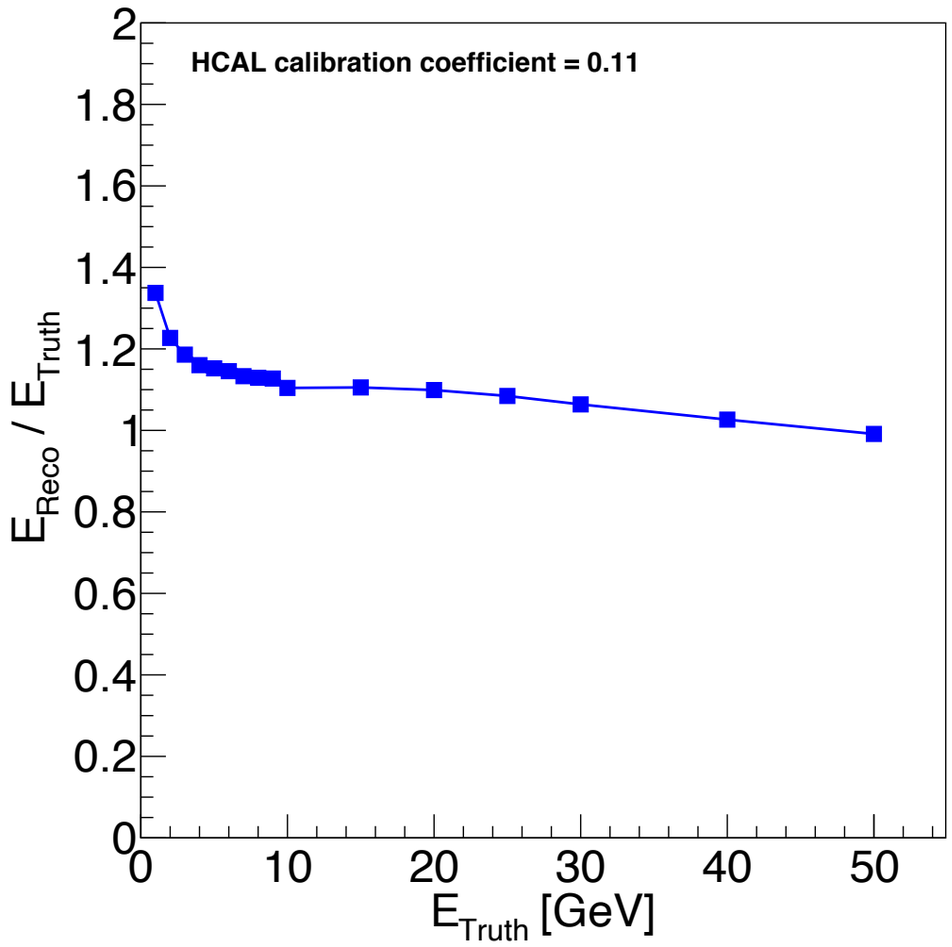

HCAL calibration coefficient = 0.08
Energy resolution: RMS / Mean
E_{Truth} [GeV]
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0
10
20
30
40
50

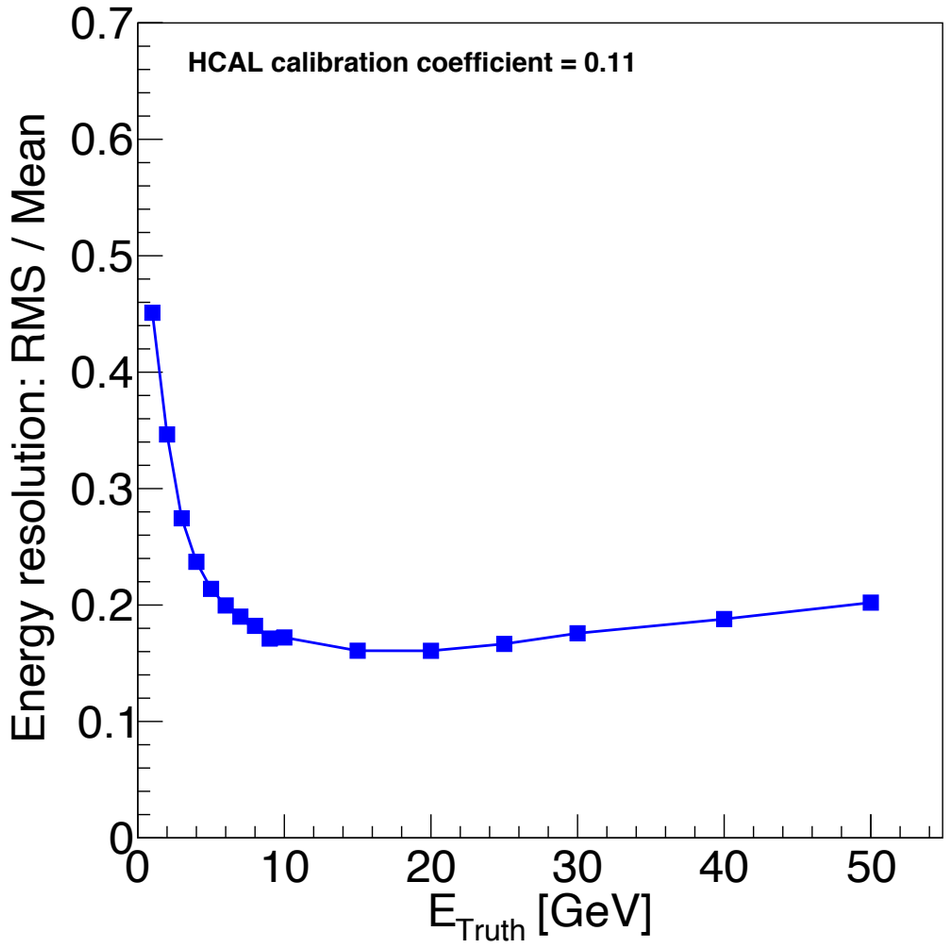
Si-W ECAL + SDHCAL



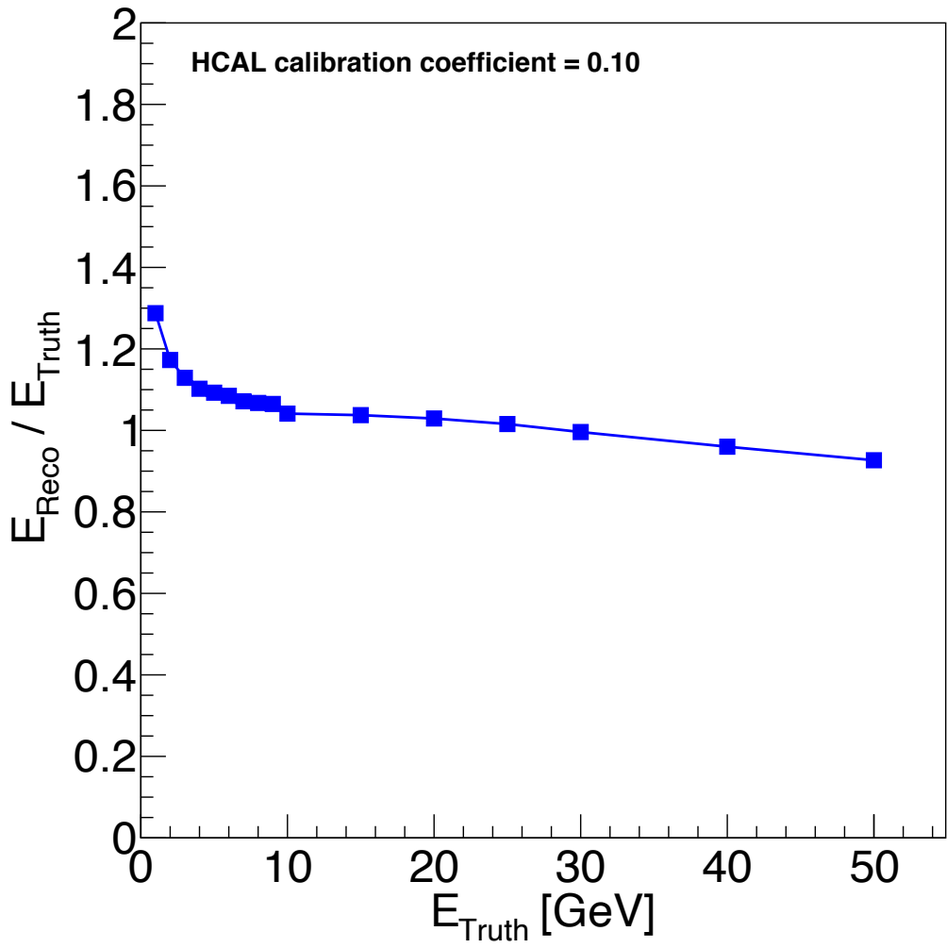


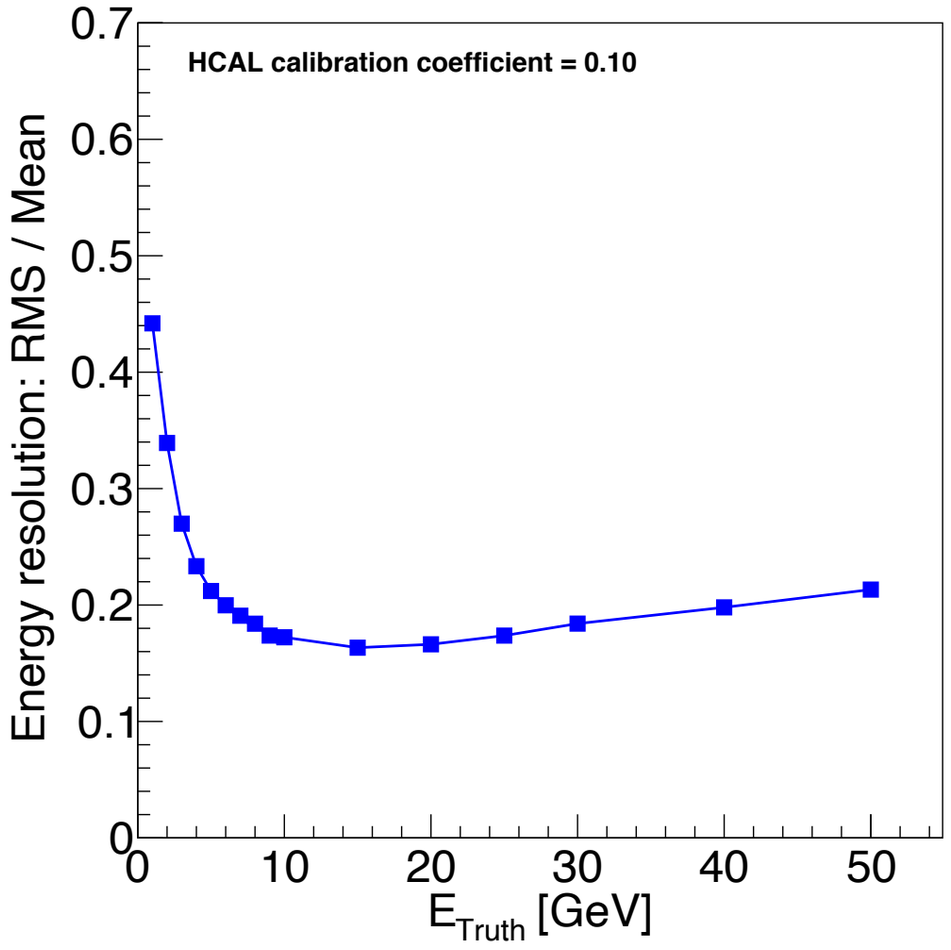
Si-W ECAL + SDHCAL



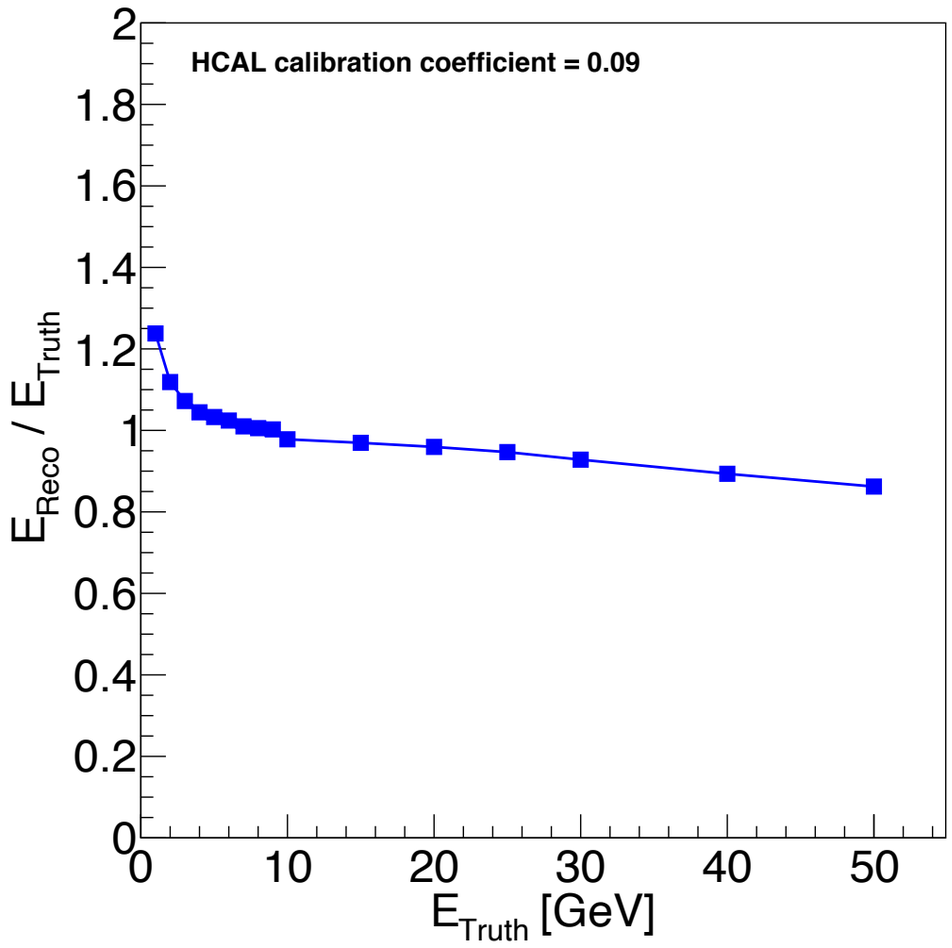


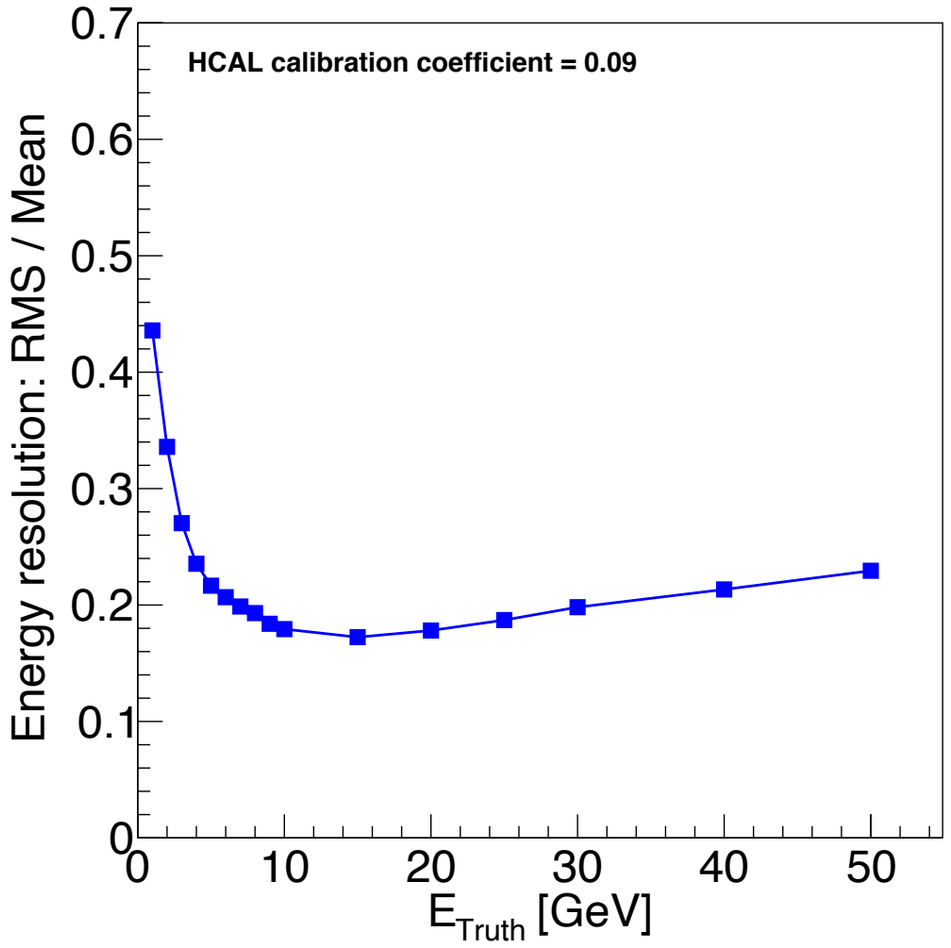
Si-W ECAL + SDHCAL



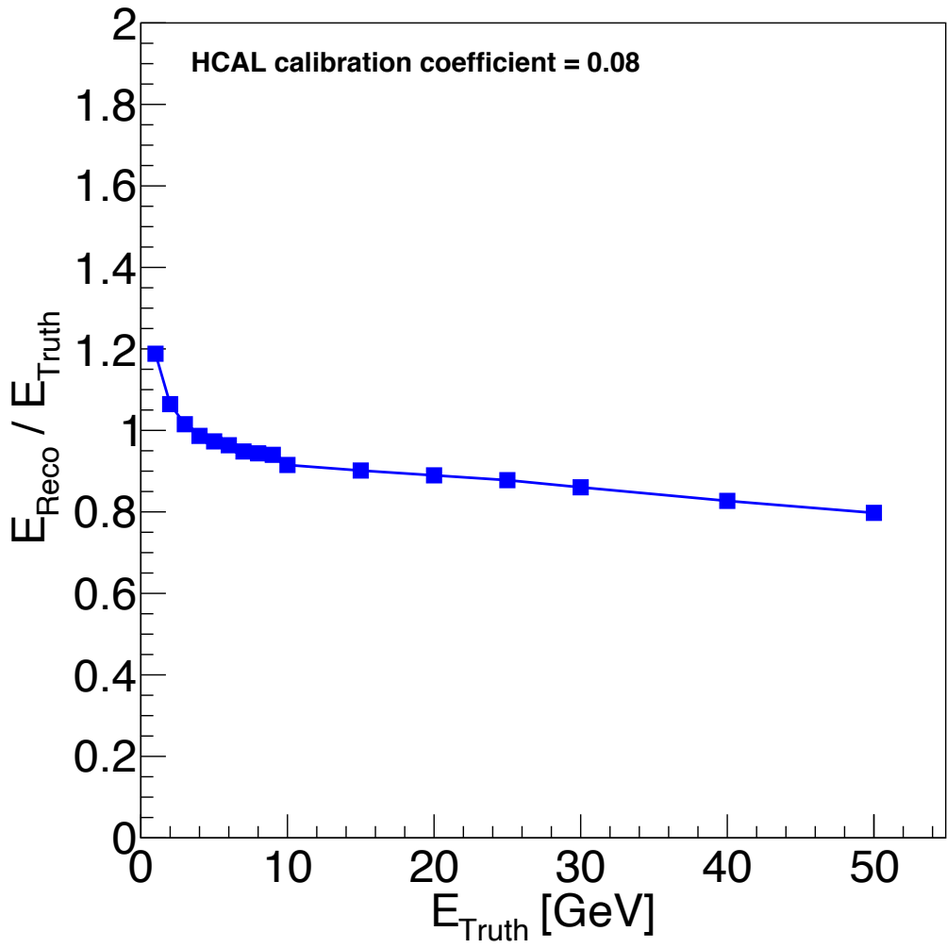


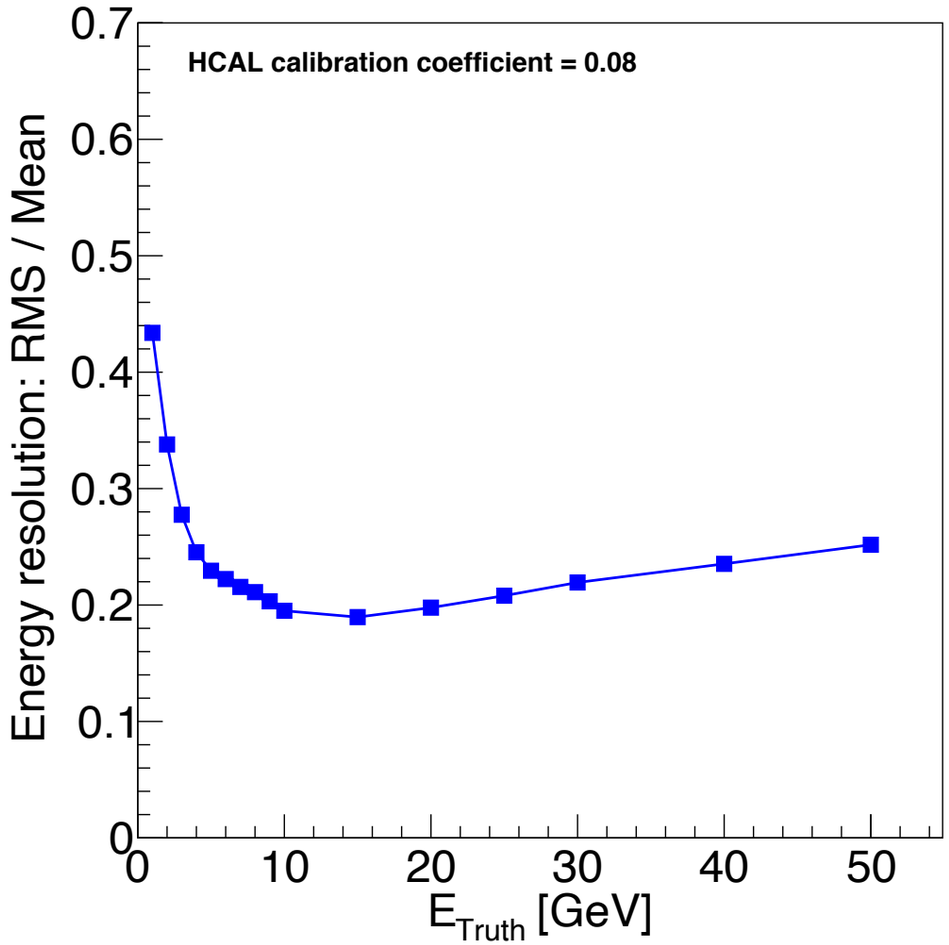
Si-W ECAL + SDHCAL



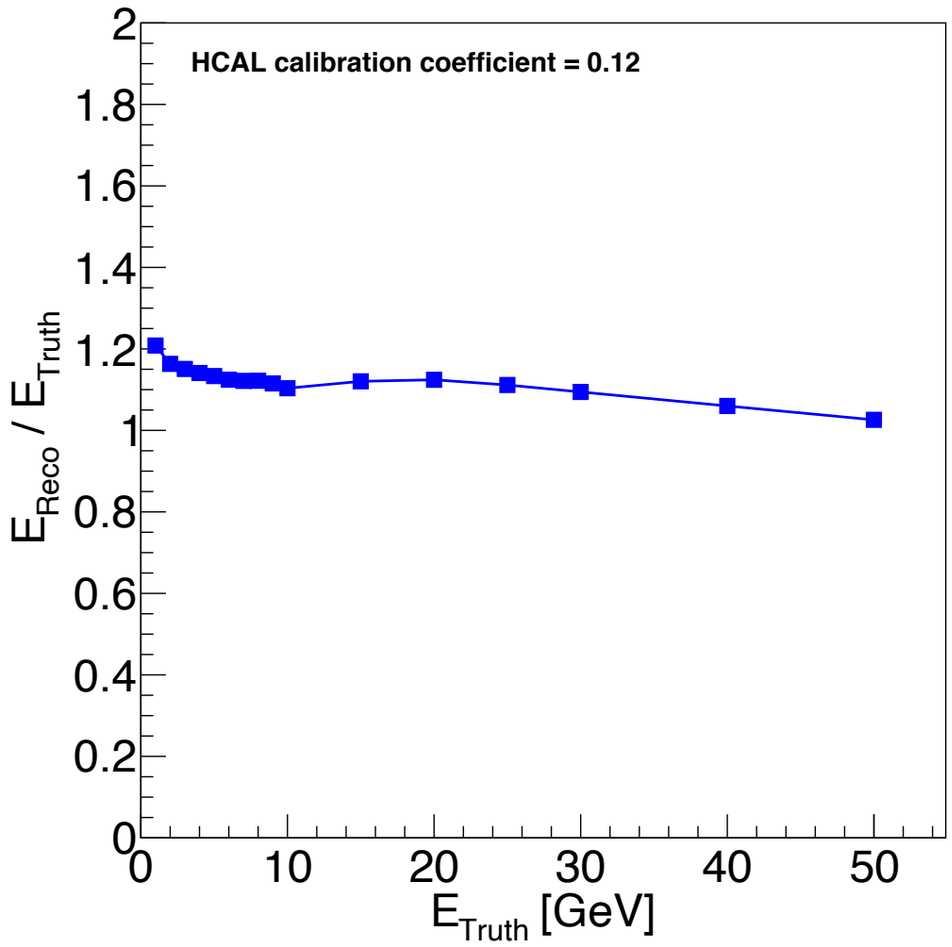


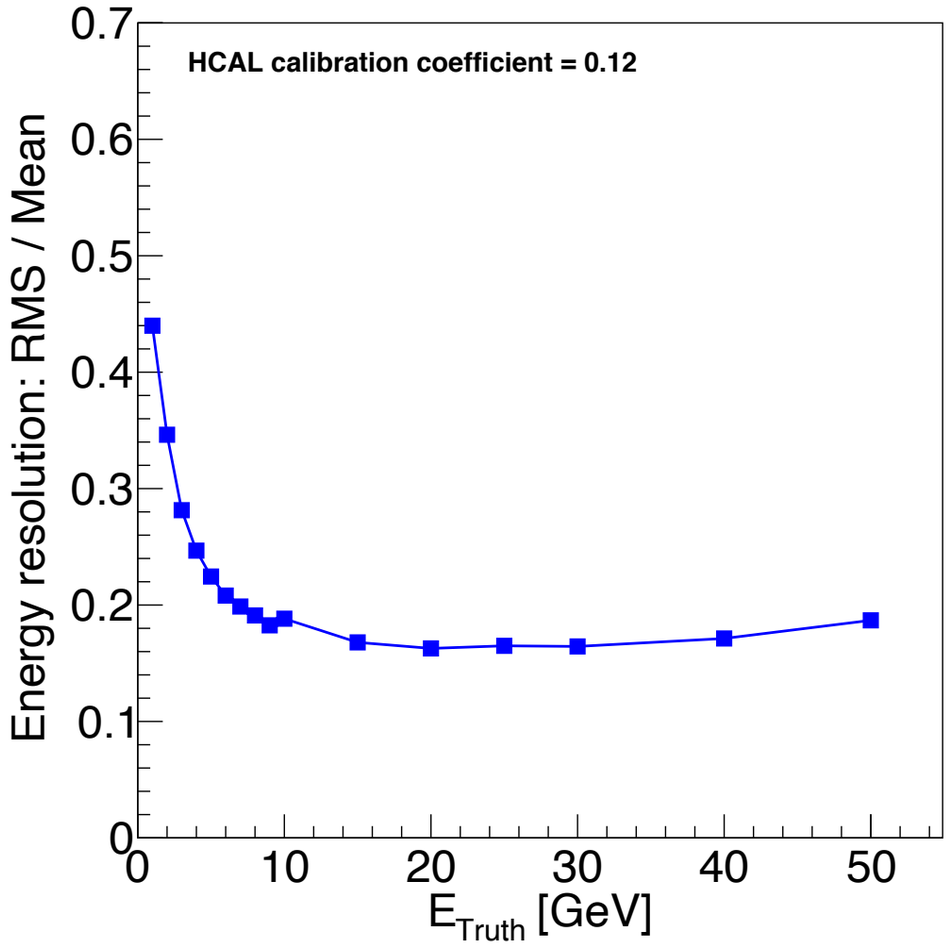
Si-W ECAL + SDHCAL



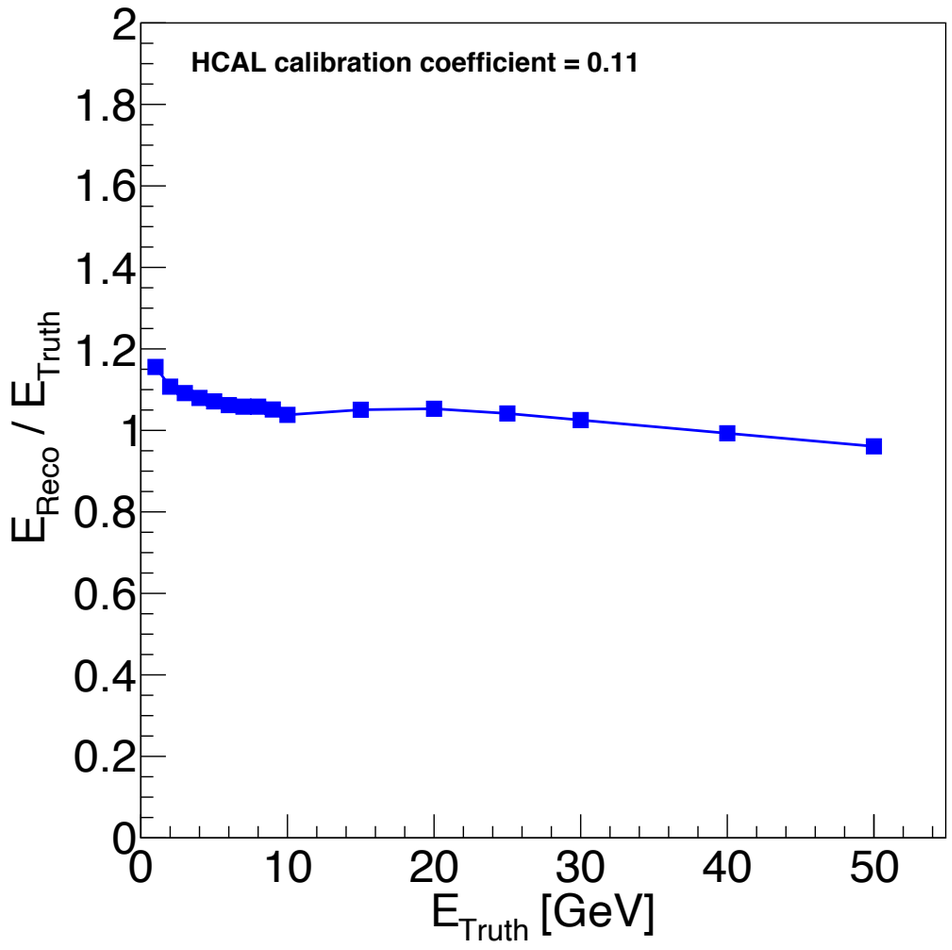


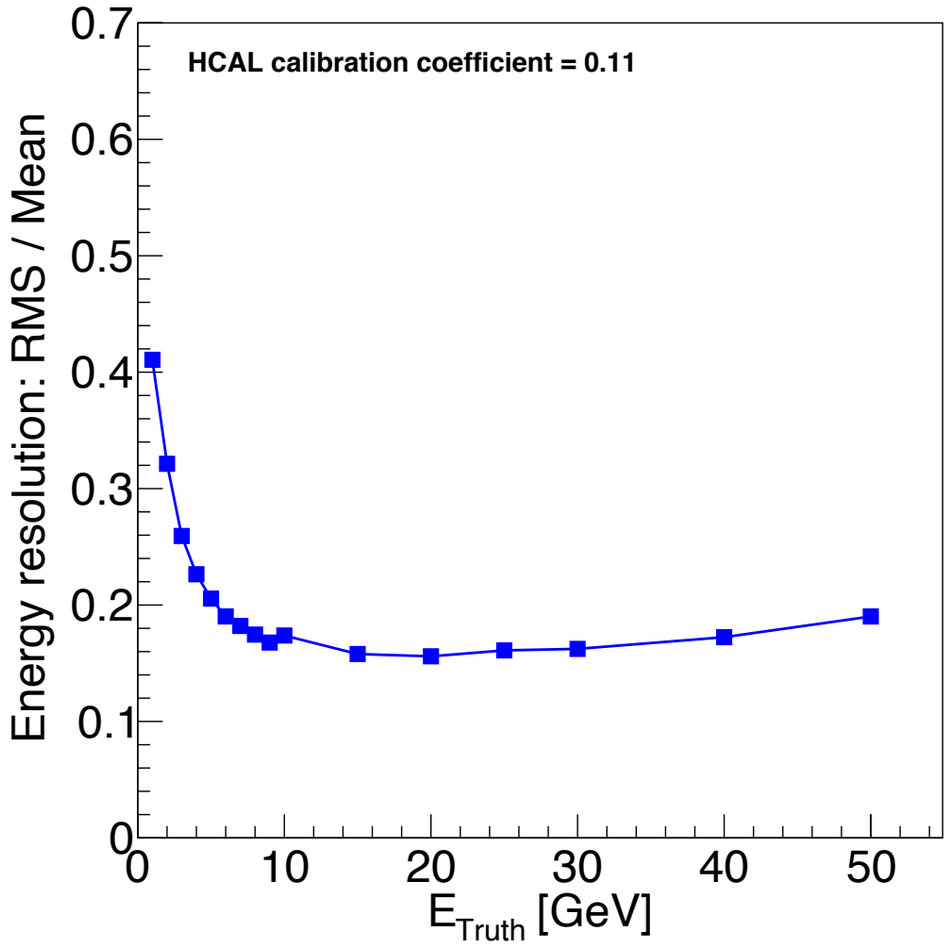
PWO ECAL + SDHCAL



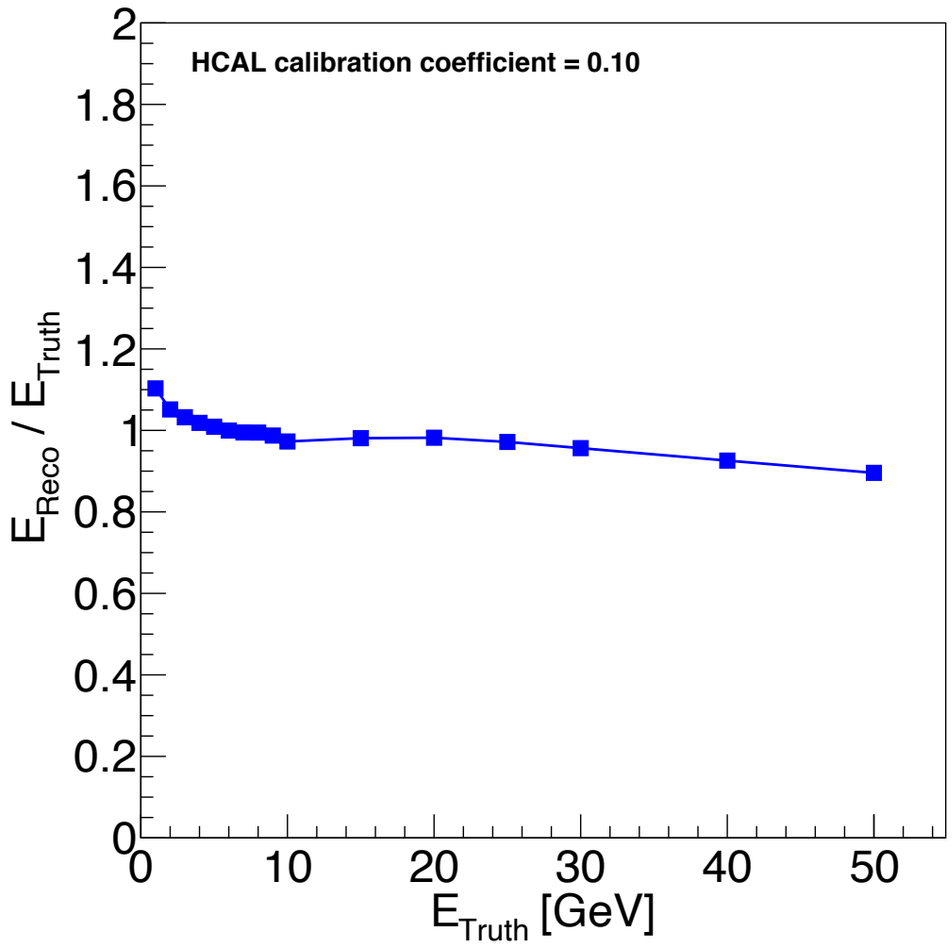


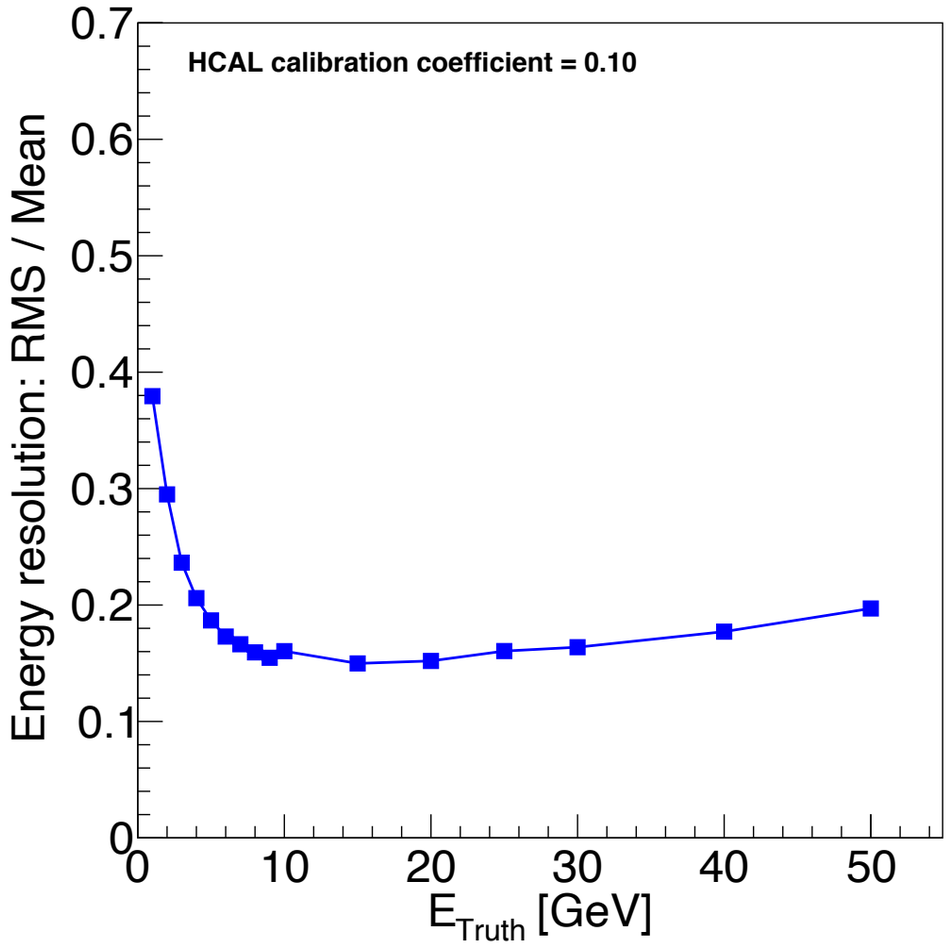
PWO ECAL + SDHCAL



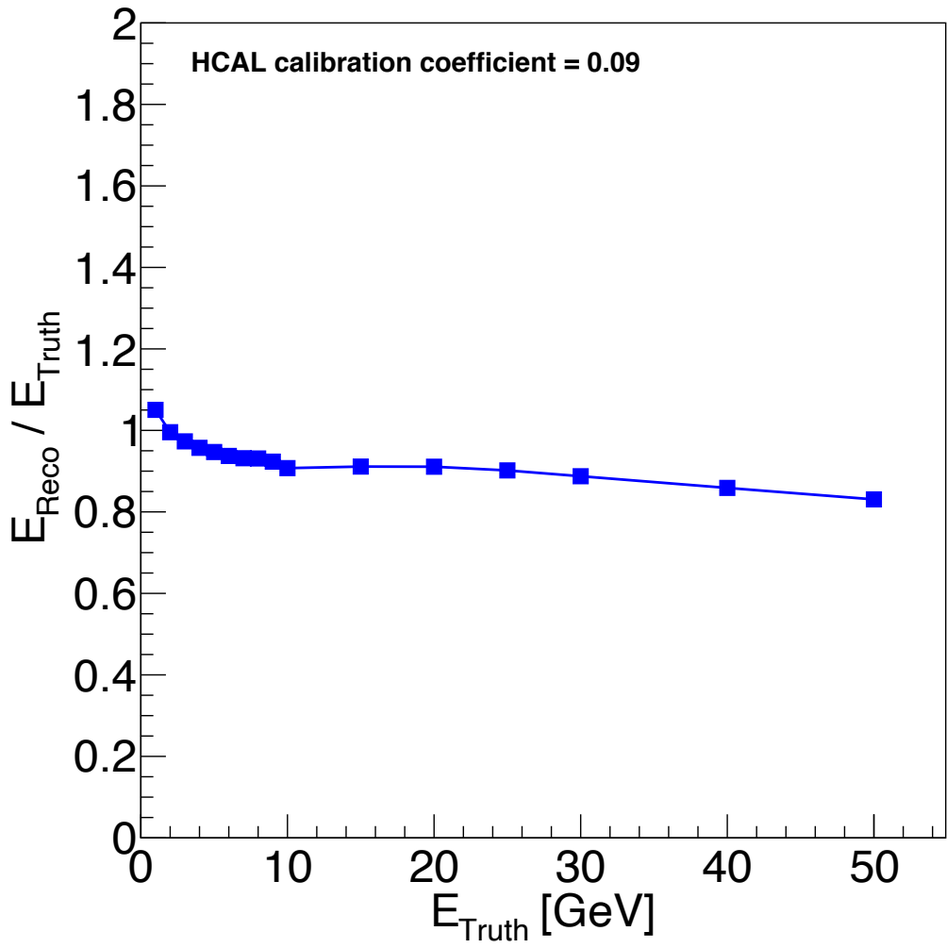


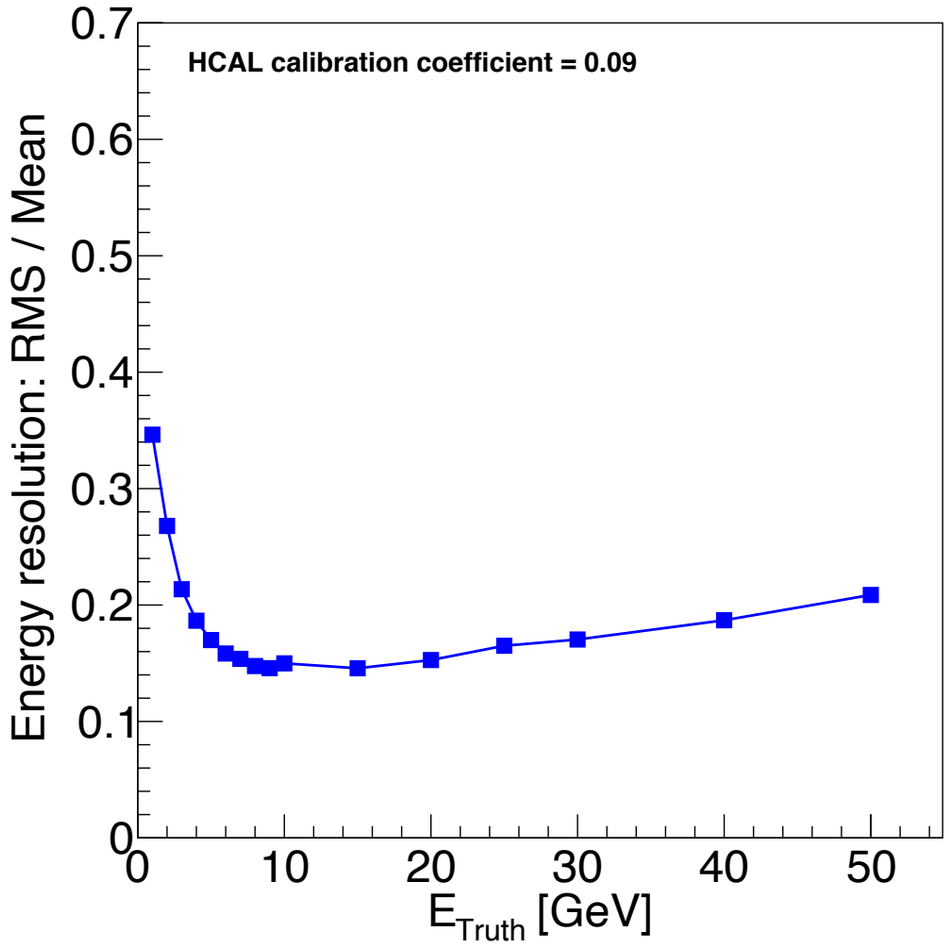
PWO ECAL + SDHCAL



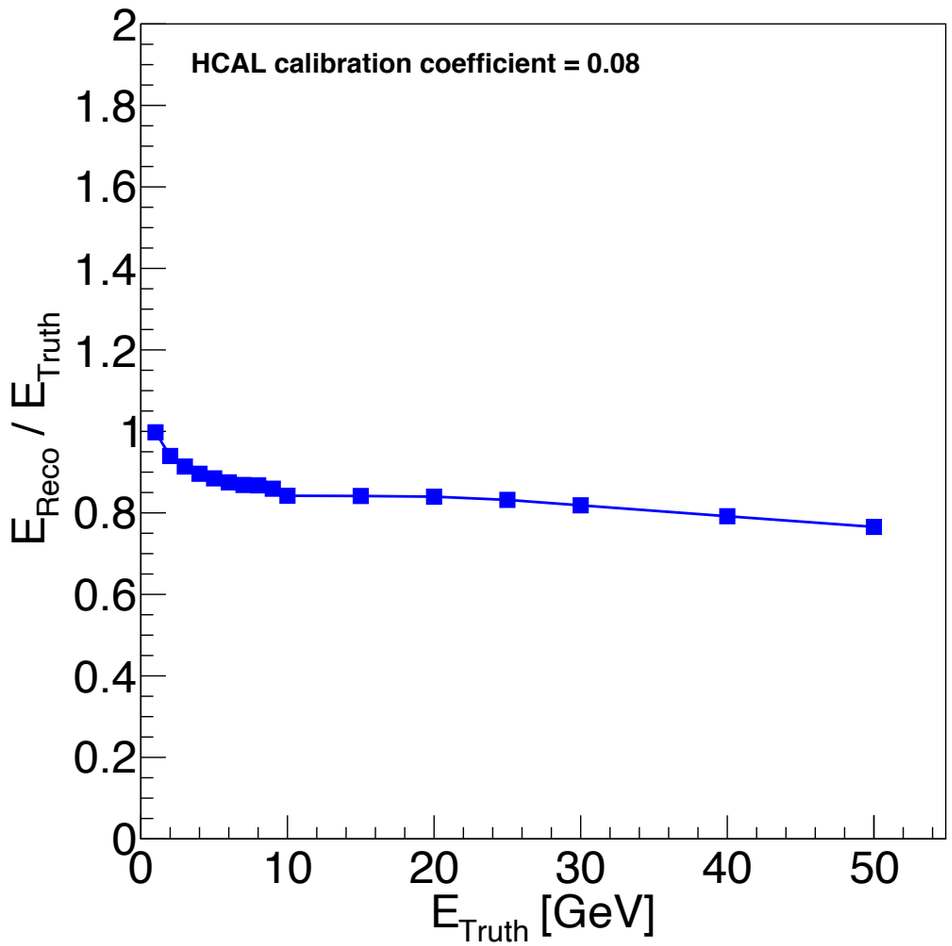


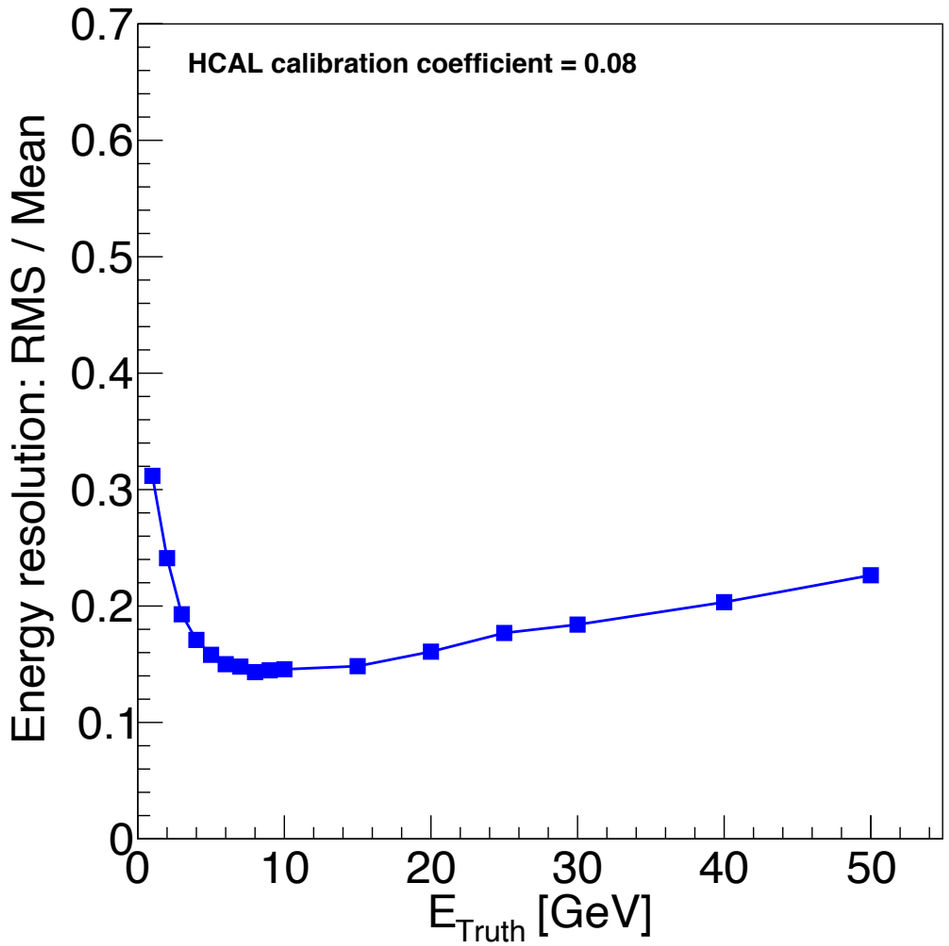
PWO ECAL + SDHCAL



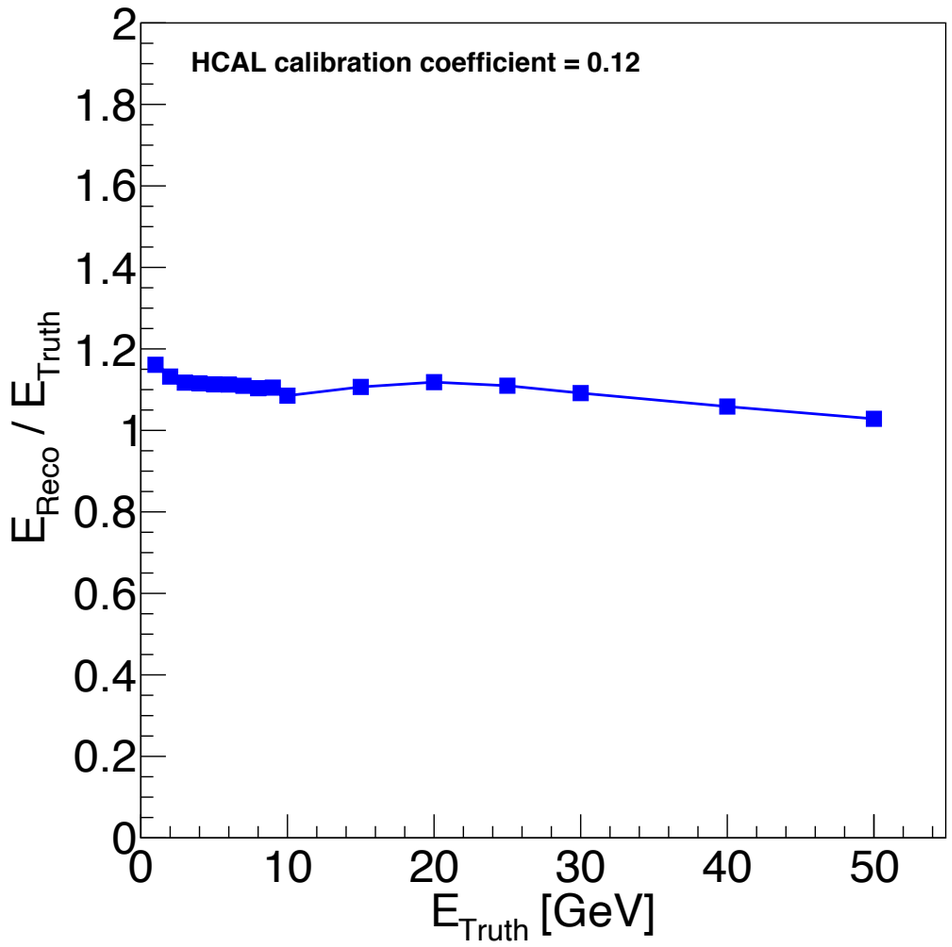


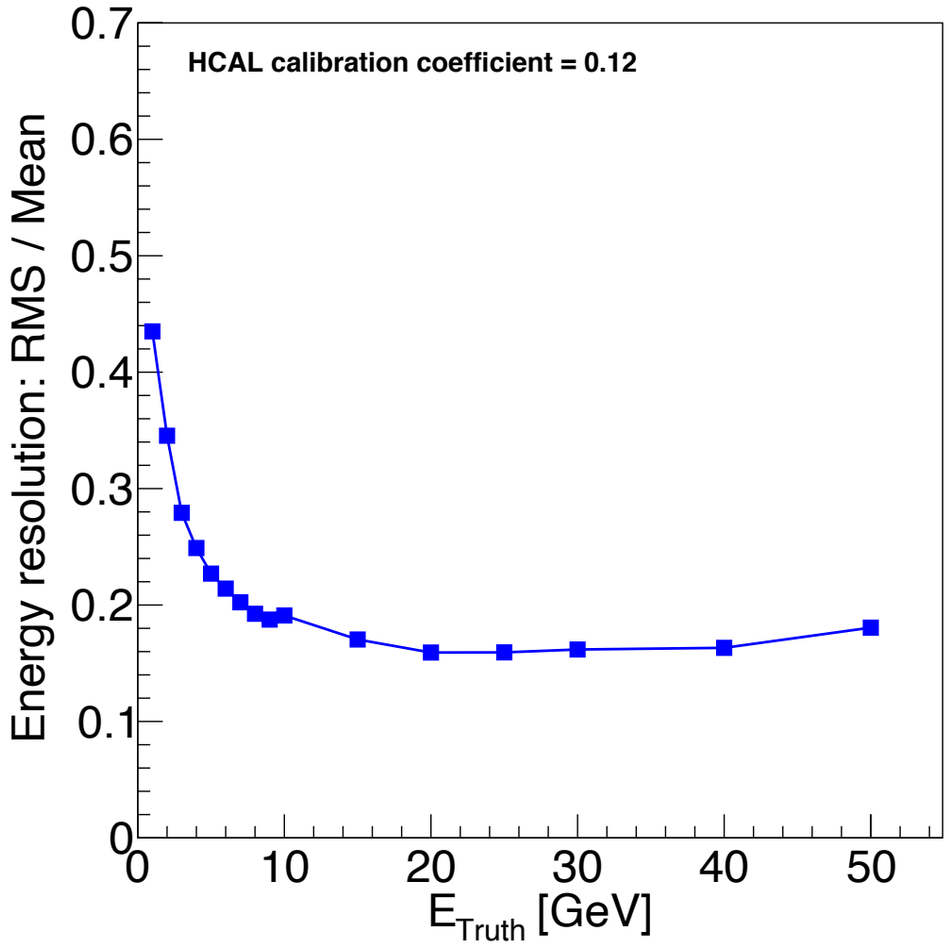
PWO ECAL + SDHCAL





BGO ECAL + SDHCAL





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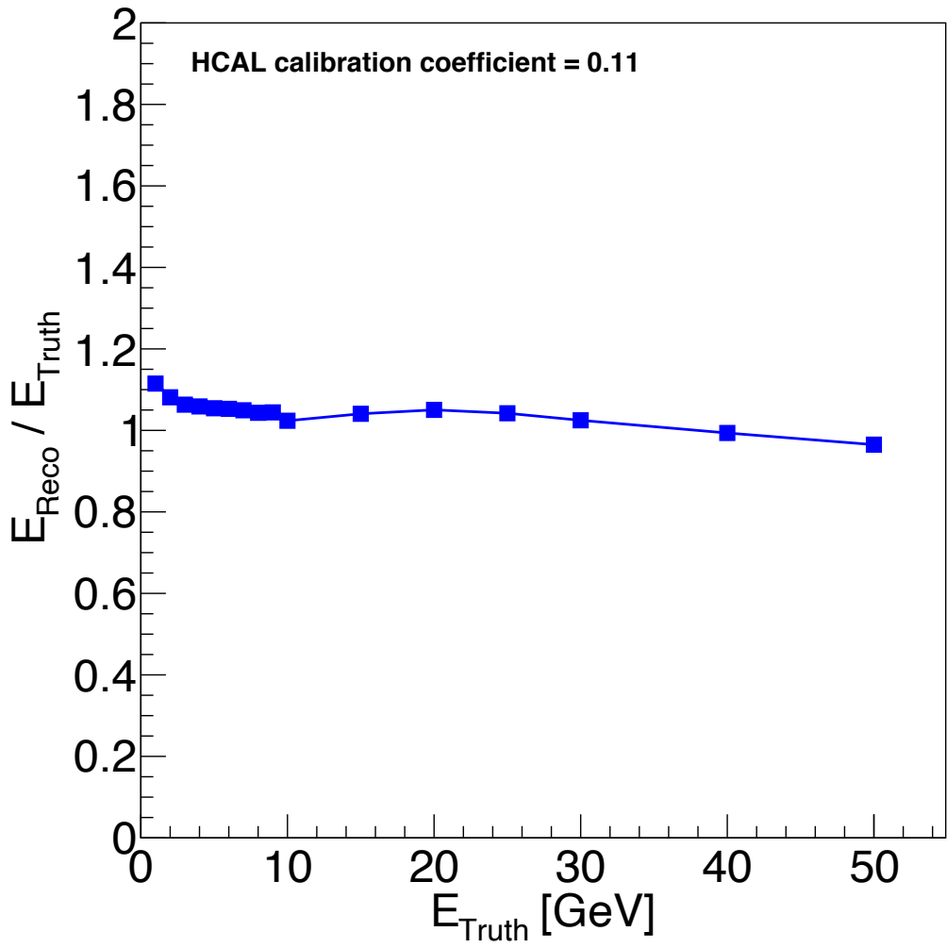

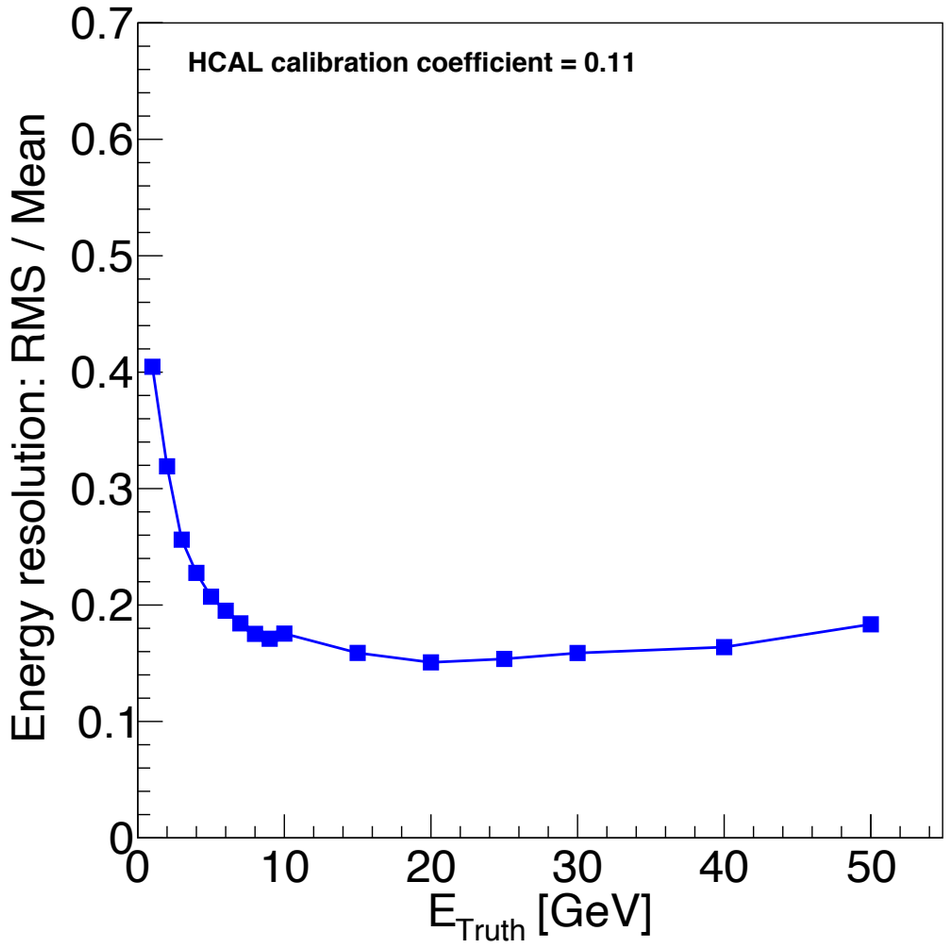

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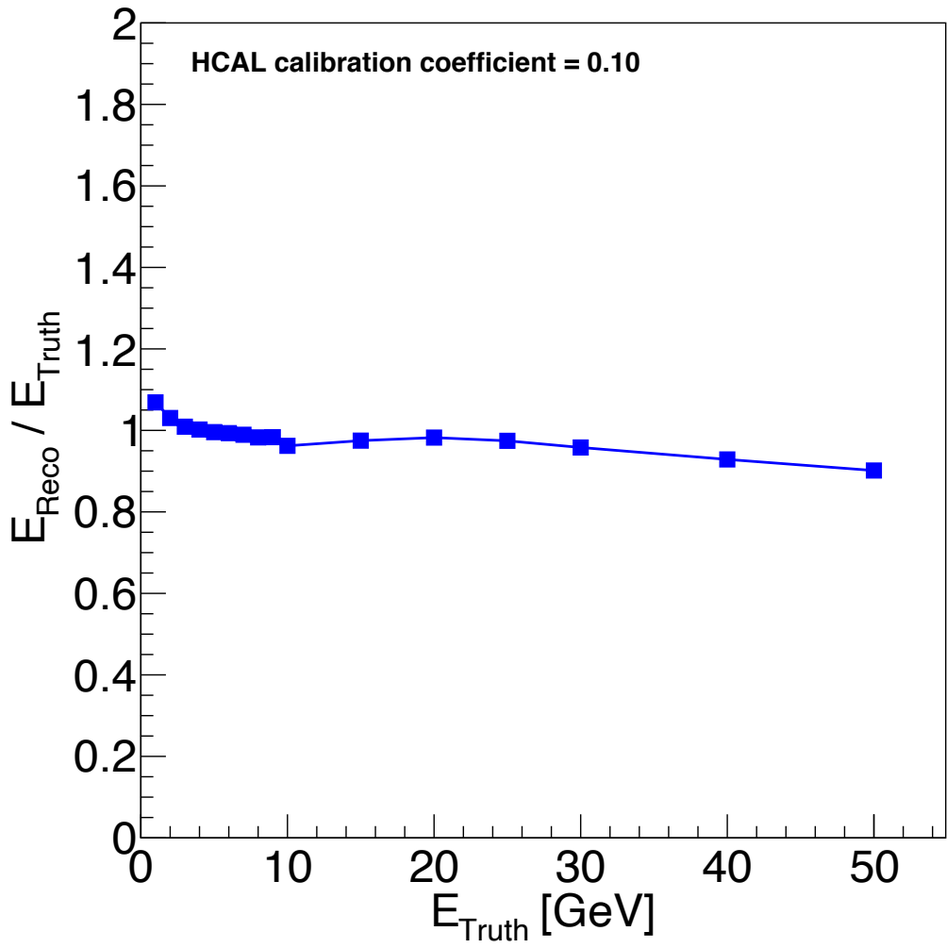

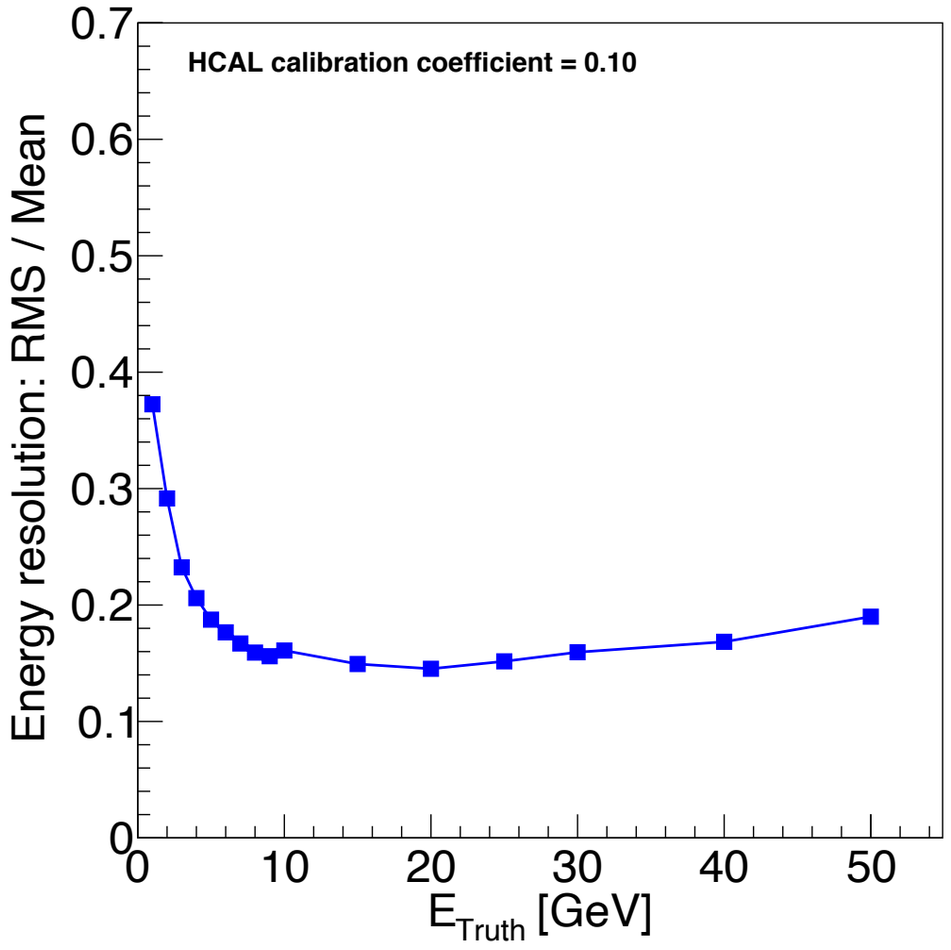

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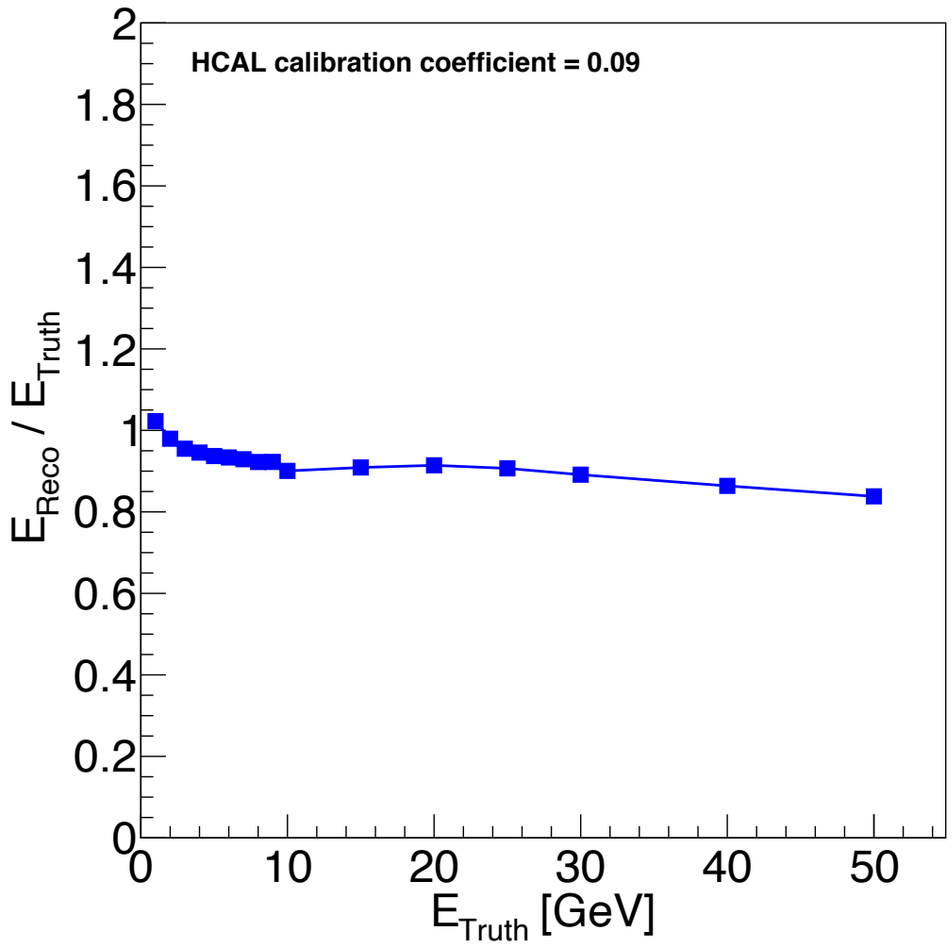

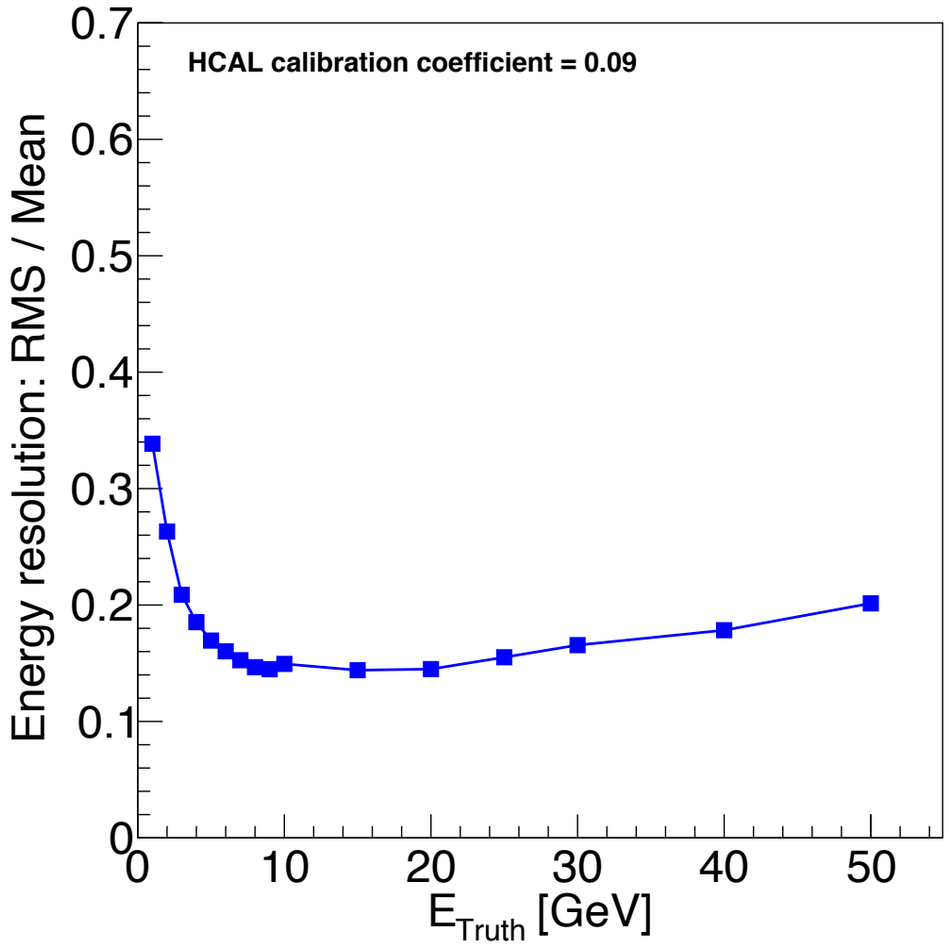

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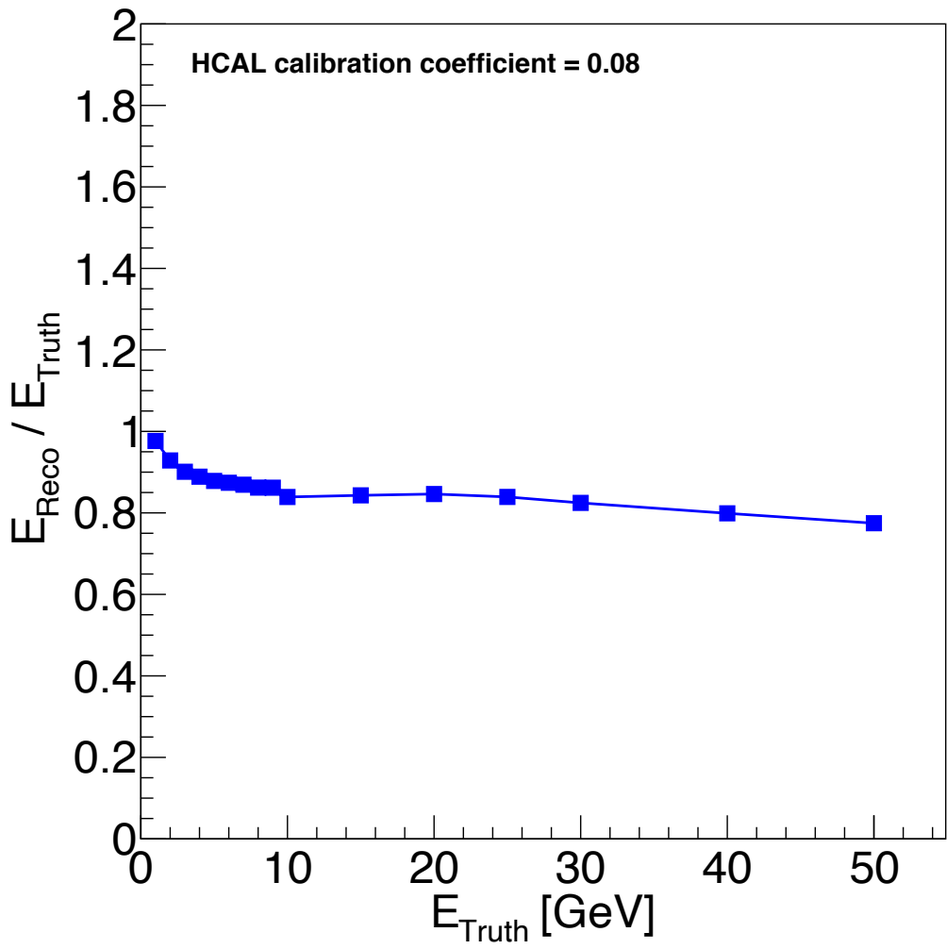
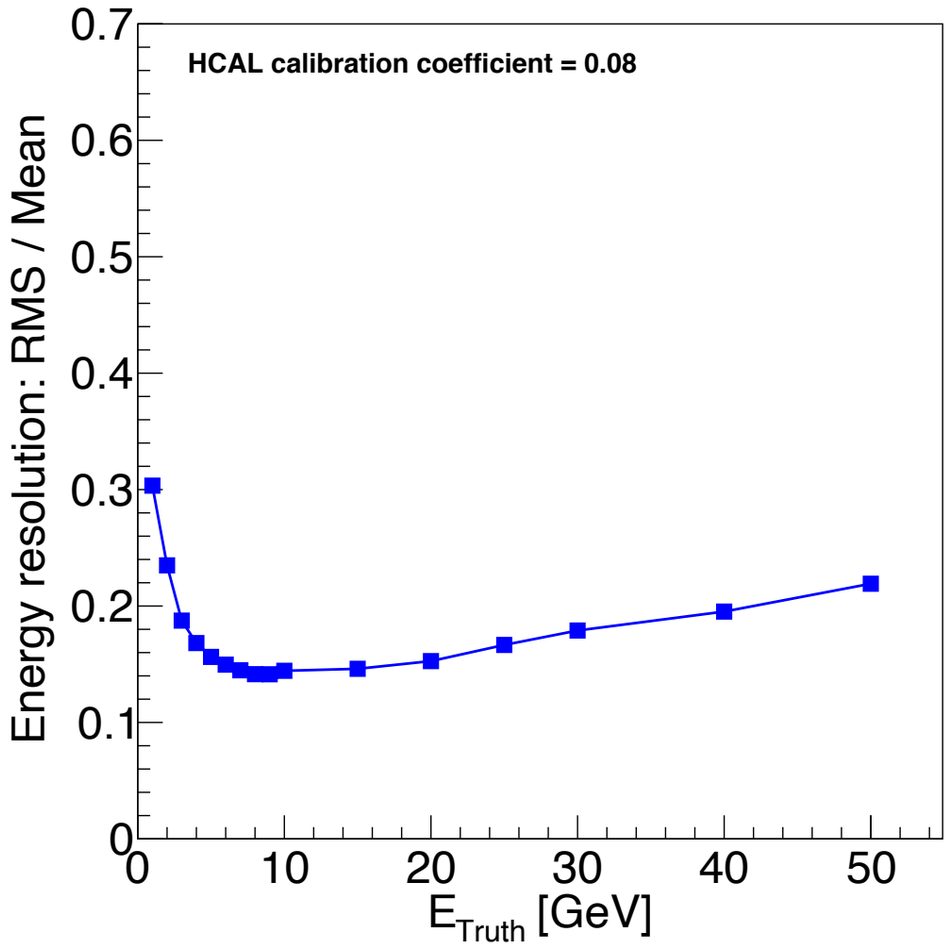
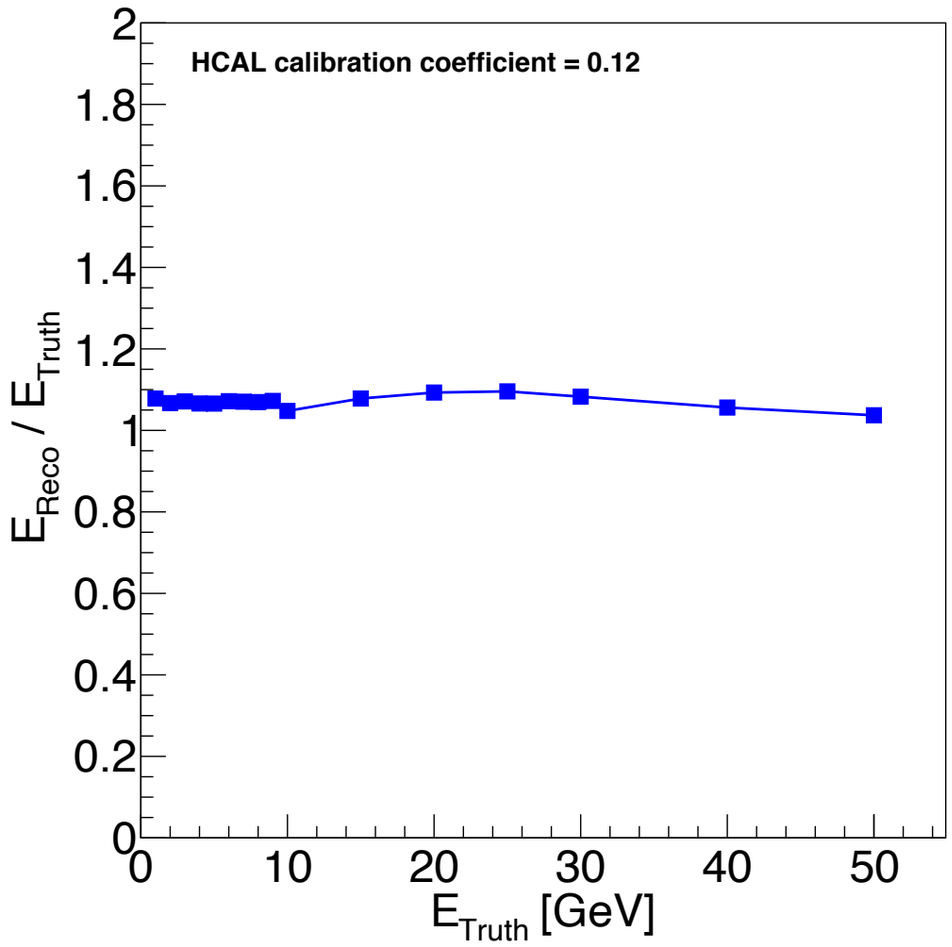
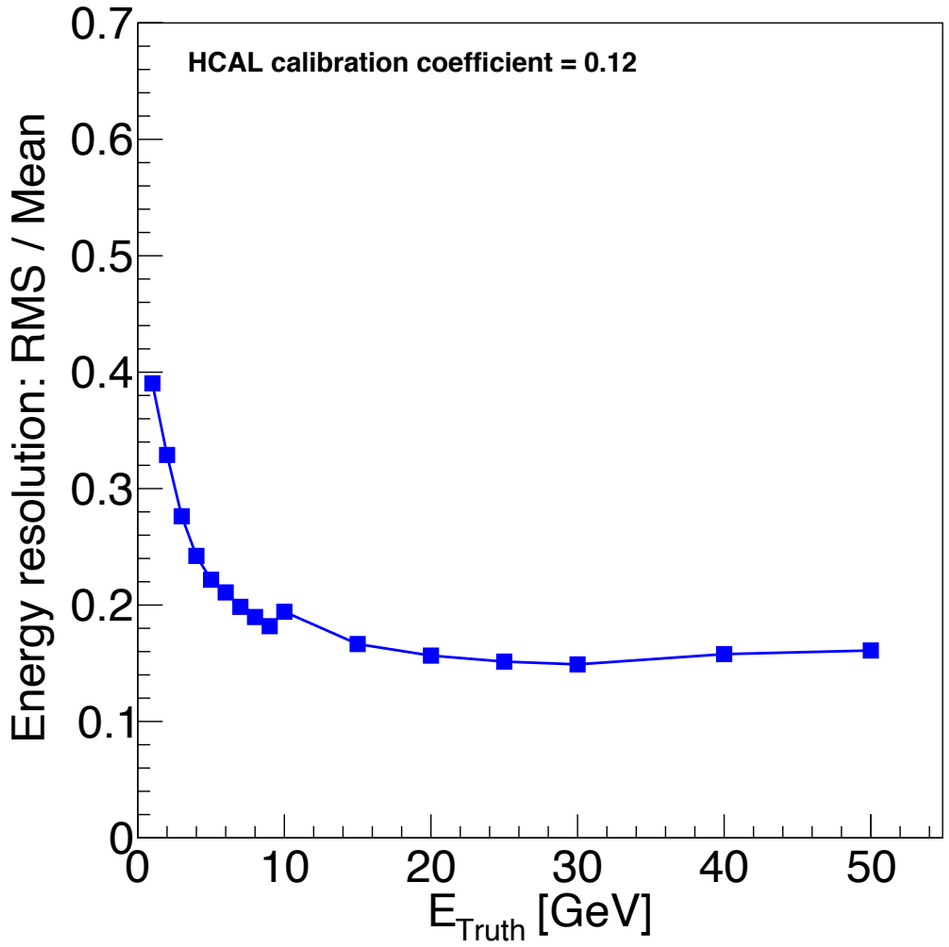


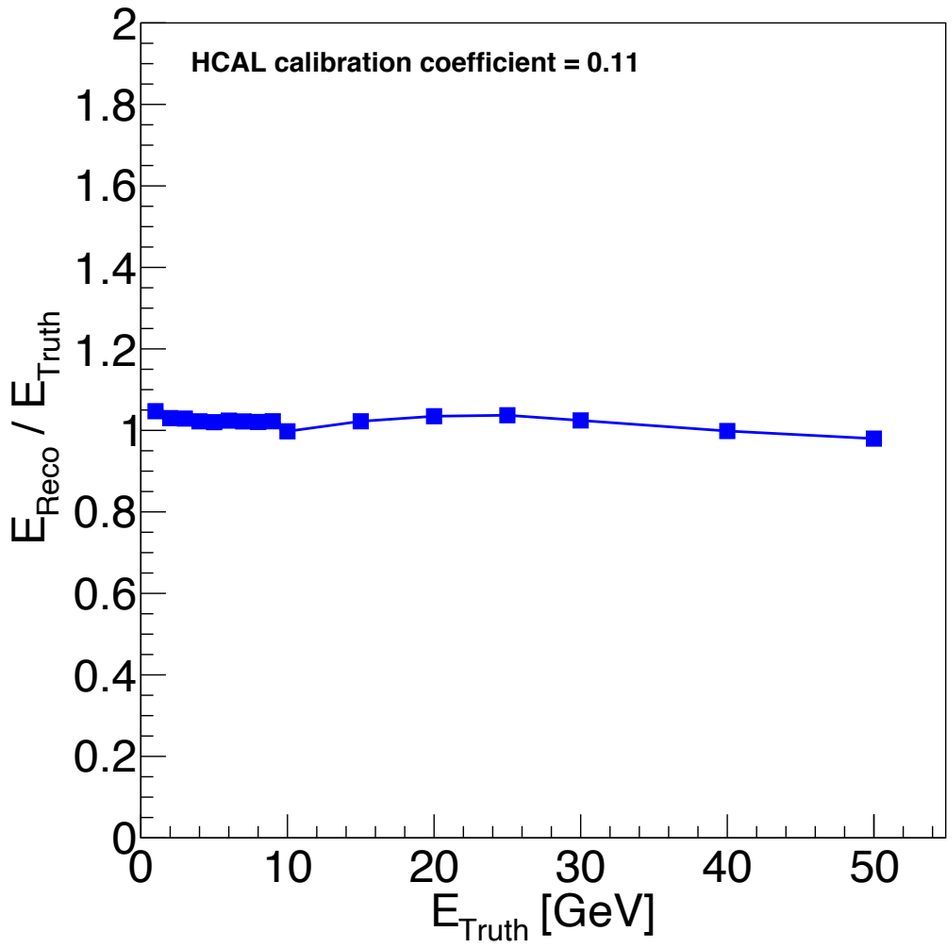


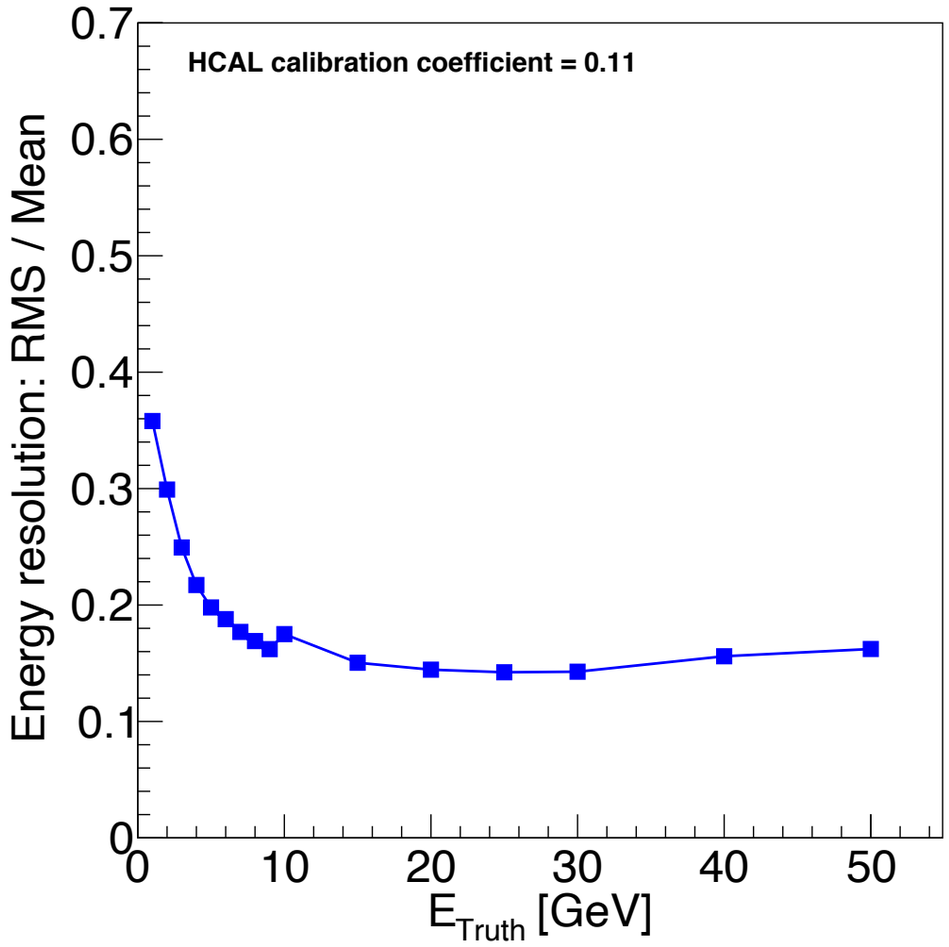
BaF2 ECAL + SDHCAL





BaF2 ECAL + SDHCAL





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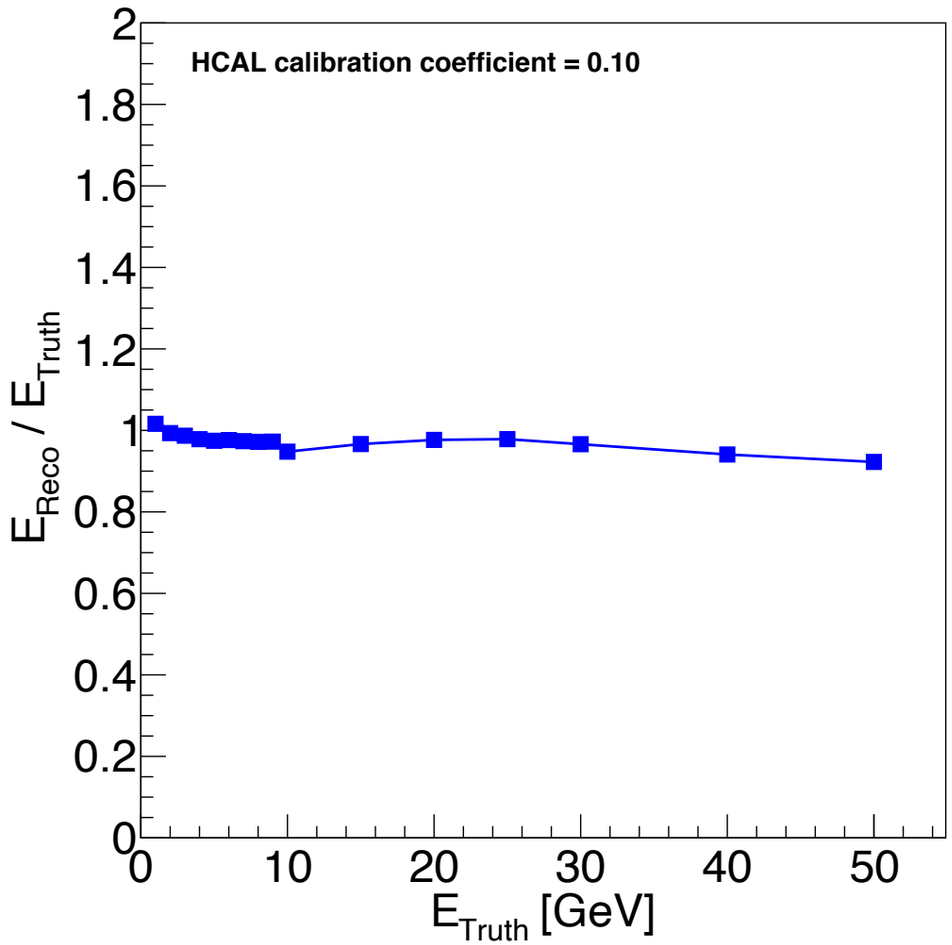

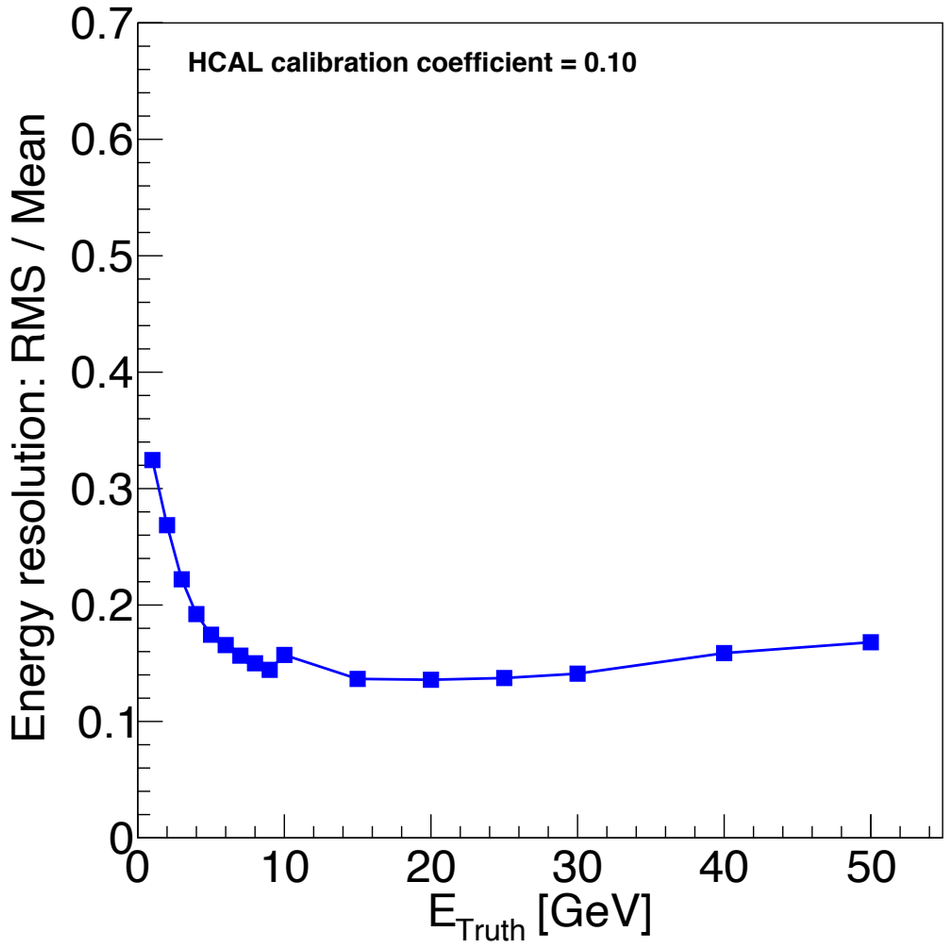

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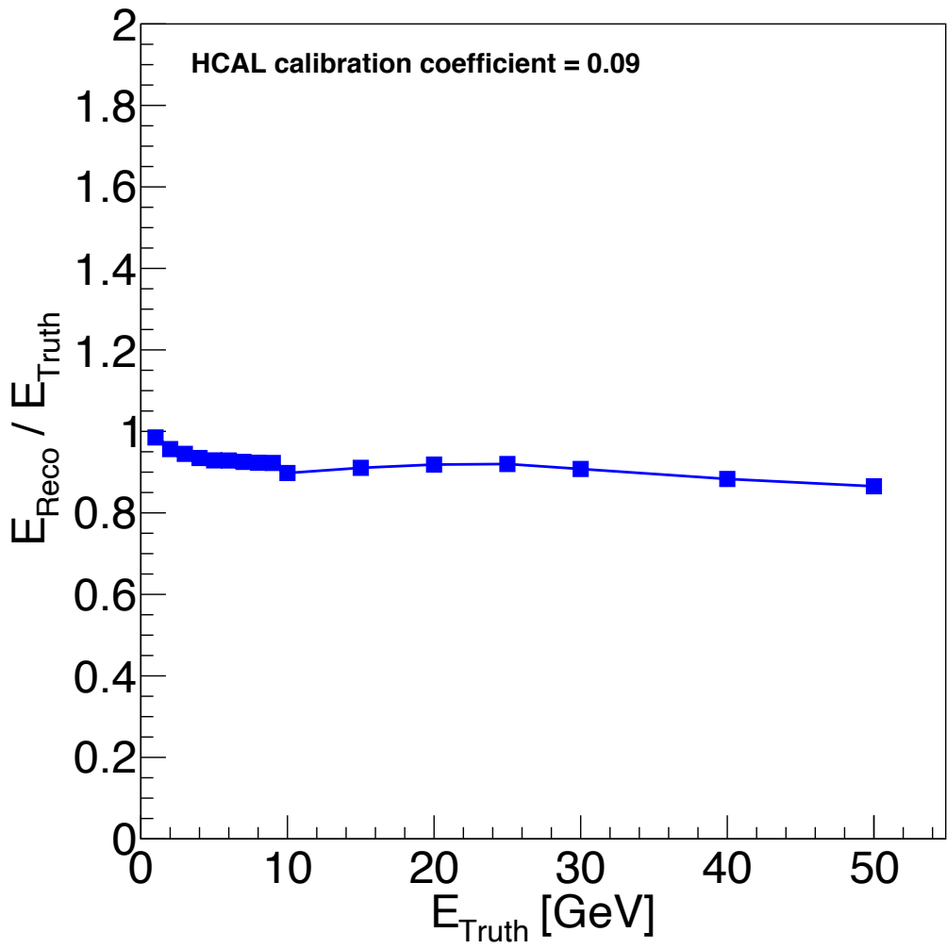

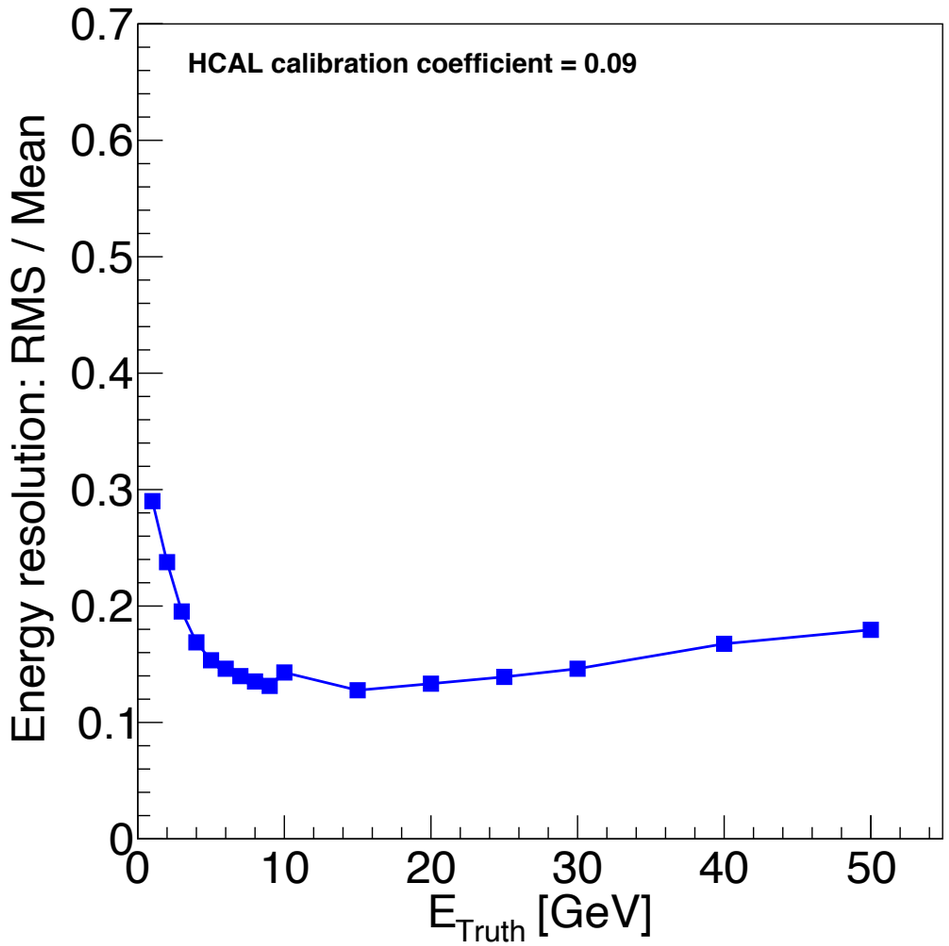
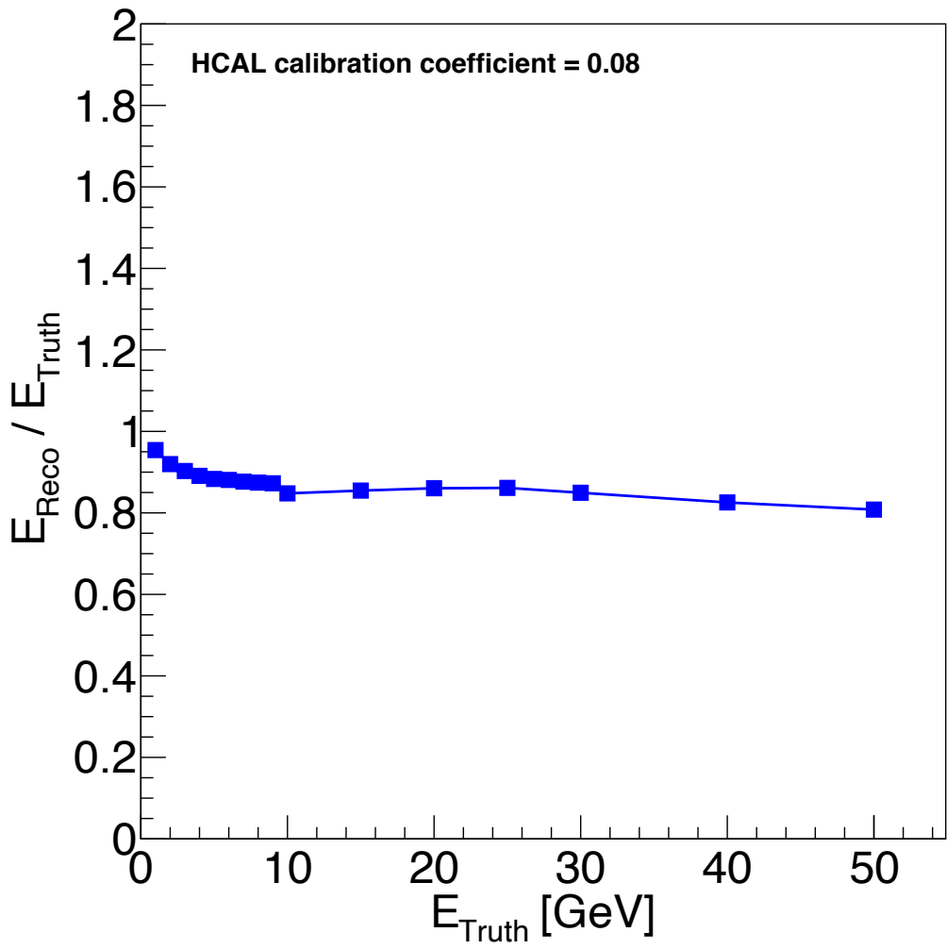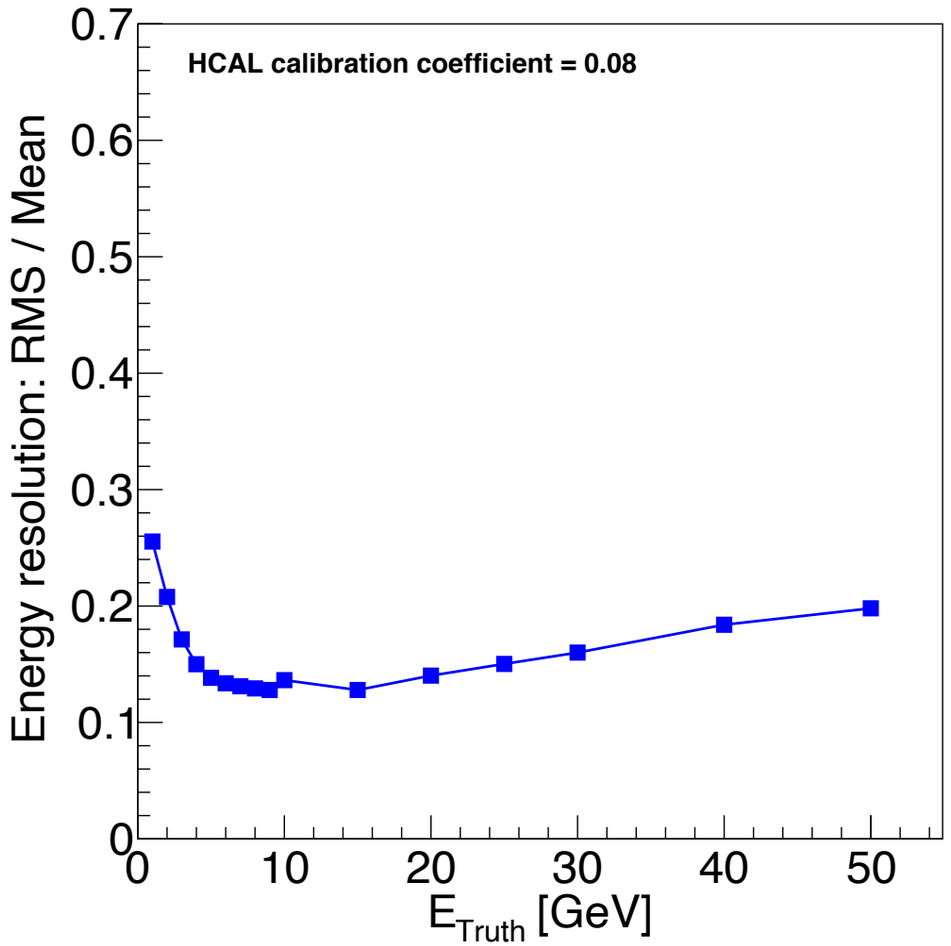
BaF2 ECAL + SDHCAL