sid03

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sid03

- Differences from sid02
- Does it matter?

sid03: differences from sid02

- Cylindrical approximation
- Hcal
- Ecal
- Muon system

Cylindrical approximation

- 12-gons are approximated by a cylinder with inner radius = 1.01162*(innermost R of 12-gon), with all material widths scaled by 1.01162. (meanR integrated over phi)
- Octagons are scaled by 1.02674 (Muon system)

Ecal

- IR = 1265 mm
- Sensor gap = 1.25 mm
- 30 layers W (2.5 mm) + 31 layers sensor + 5 mm space for support + 8 mm gap

Hcal

- IR = 1417 mm
- Layer = 18.9 mm steel + 8 mm sensor
- 40 layers (1076 mm) + 2 mm outer steel
- 8 mm gap to solenoid ➔ IR(solenoid) = 2593 mm

Muon system

- Octagon → cylinder approximation
- 11 layers with 2 readouts/layer ➔ 22 layers with 1 readout/layer to allow hitID → position. (NO change in material layout, only the hit tags)

Does it matter? Comparison with sid02

- Sampling fractions
- Calorimeter only resolutions
- PPR reconstruction
- UI reconstruction

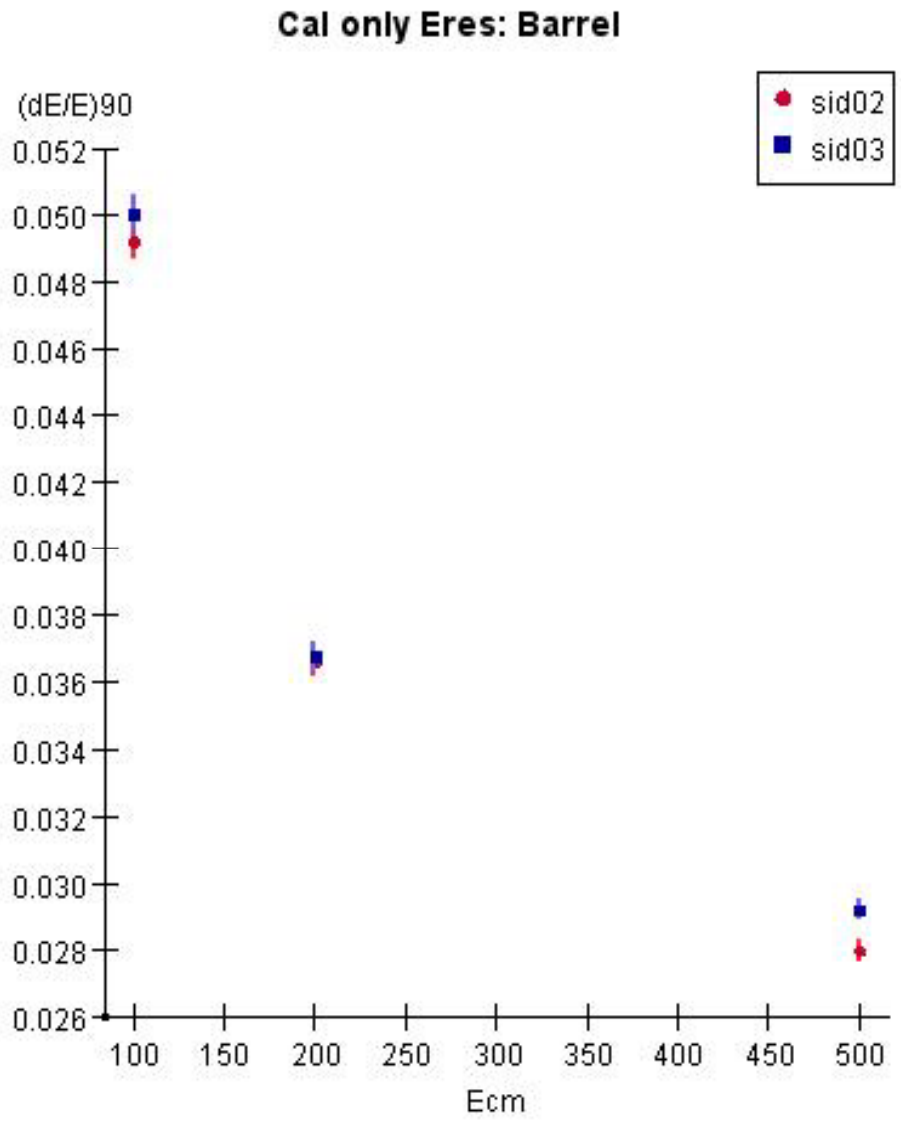
Sampling fractions

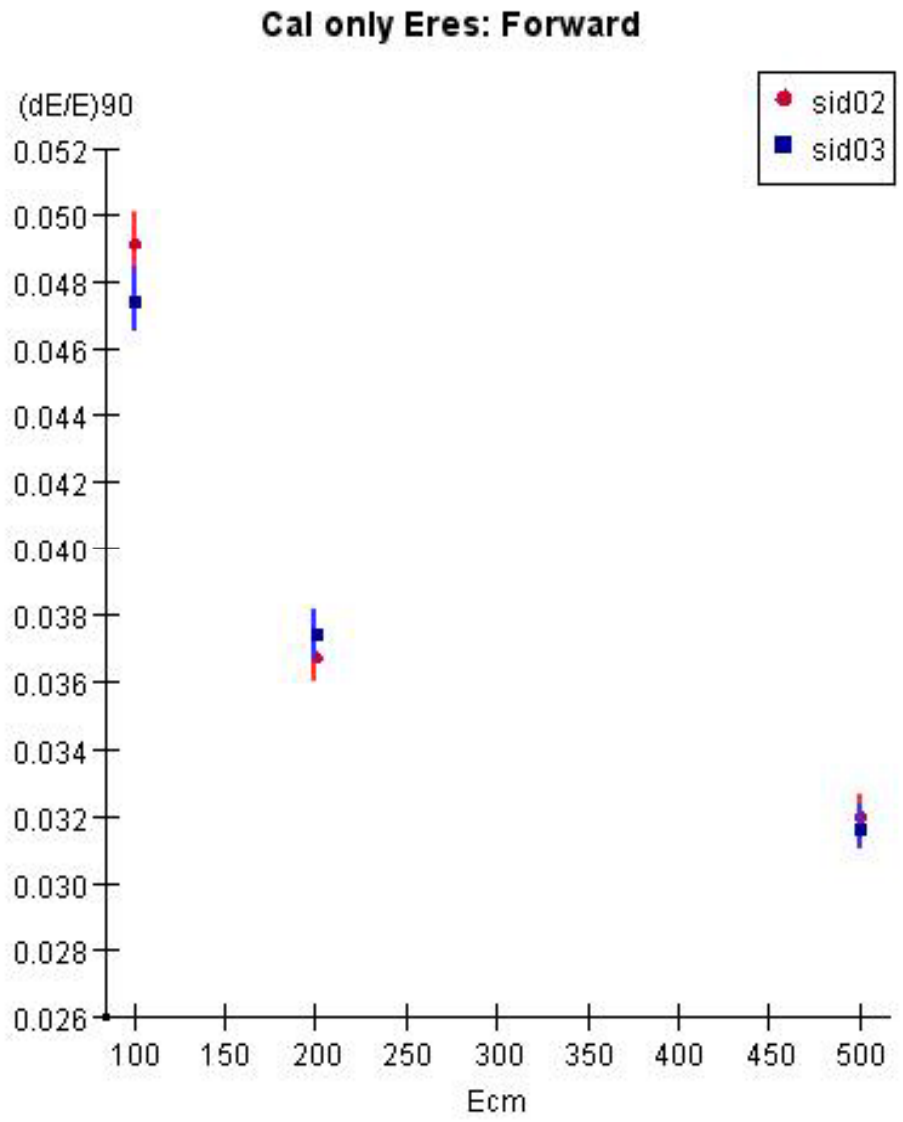
- Calculate 6 simple sampling fractions from fixed E qq data (100, 200, 500)GeV cmE, using only Ecal and Hcal.

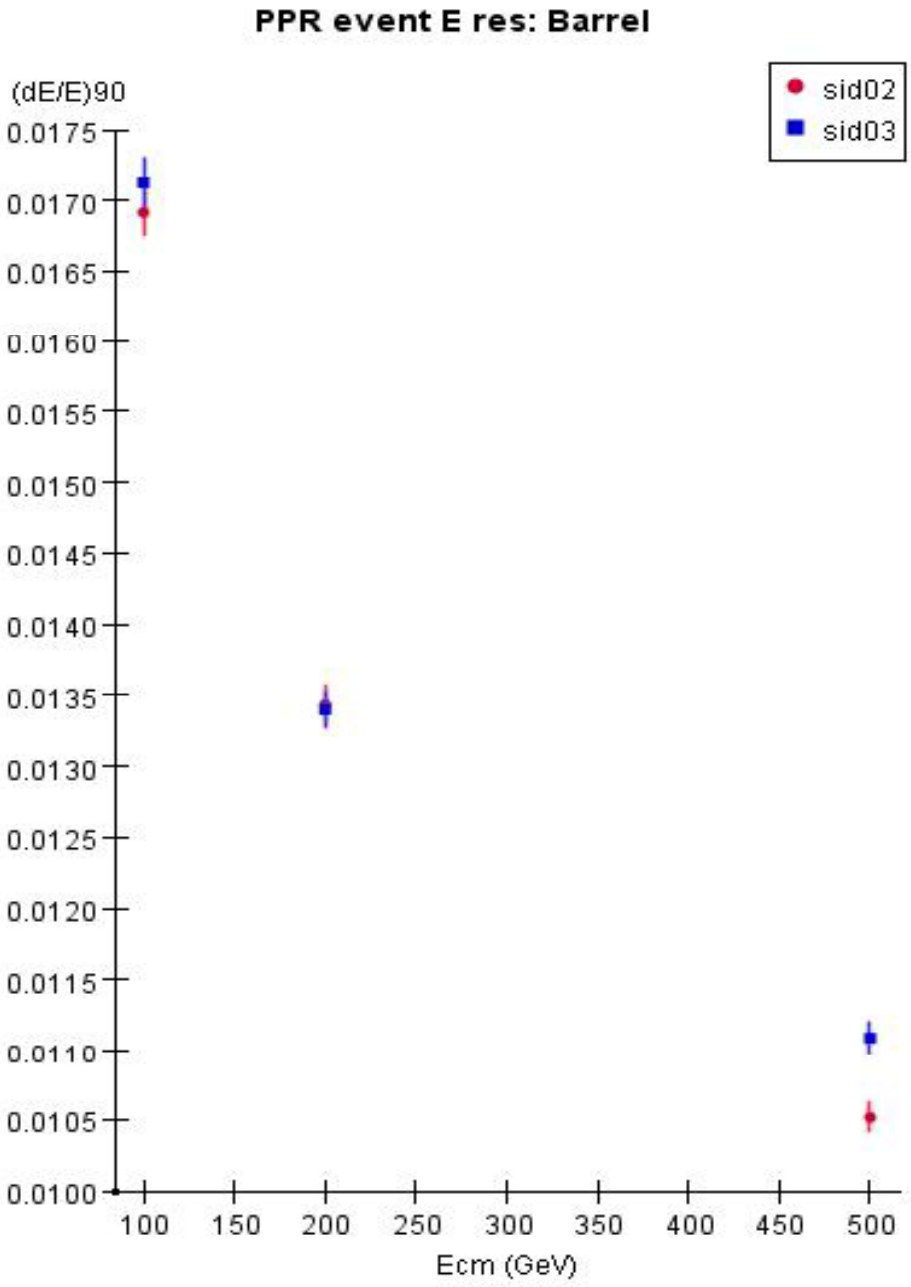
Sampling fractions

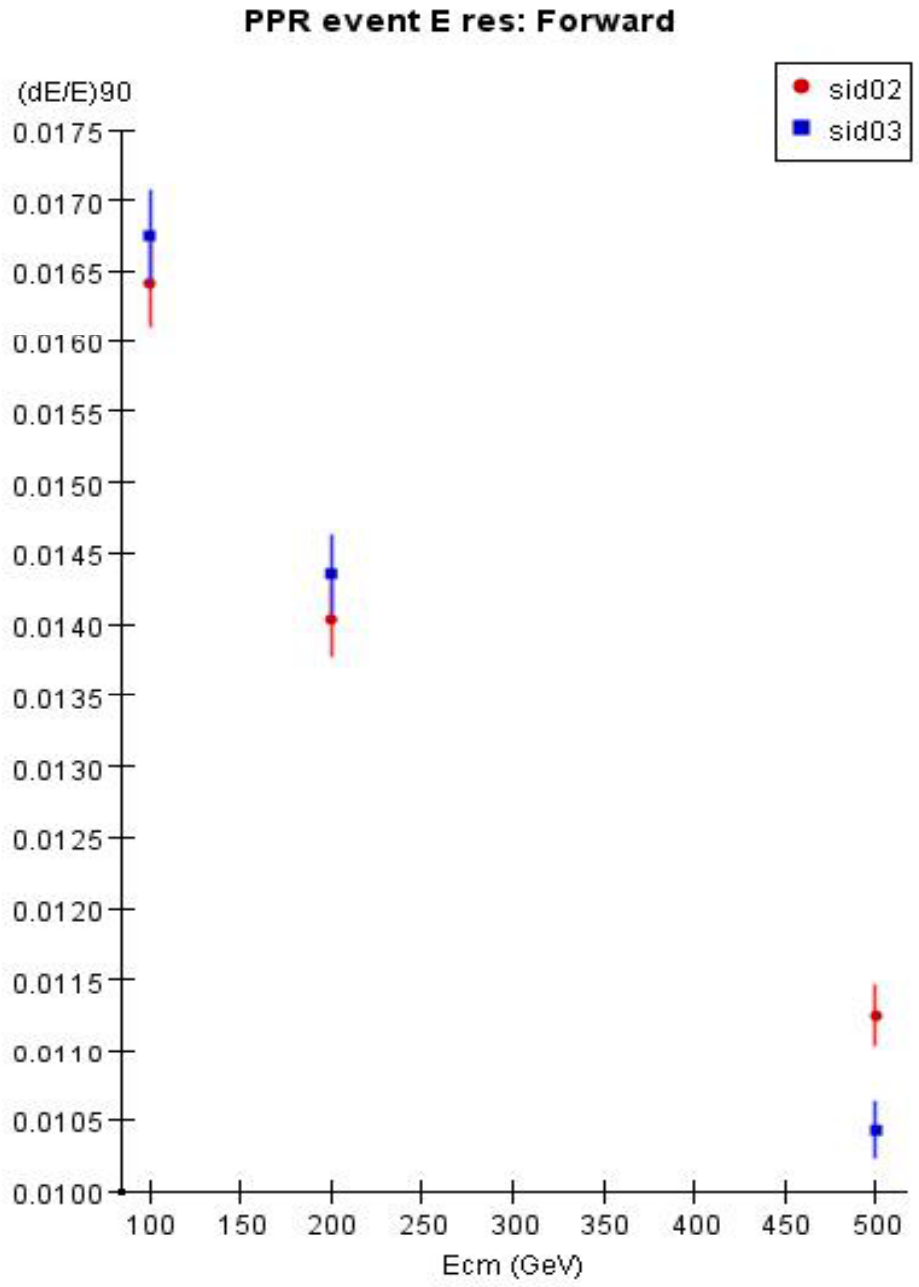
	Sid02	Sid03
EcalBarrInner	.017571	.017667
EcalBarrOuter	.0093678	.0094245
EcalEndcInn	.016495	.016515
EcalEndcOut	.0086669	.0089104
HcalBarr	8.6503	8.9956
HcalEndcap	7.5778	7.9274

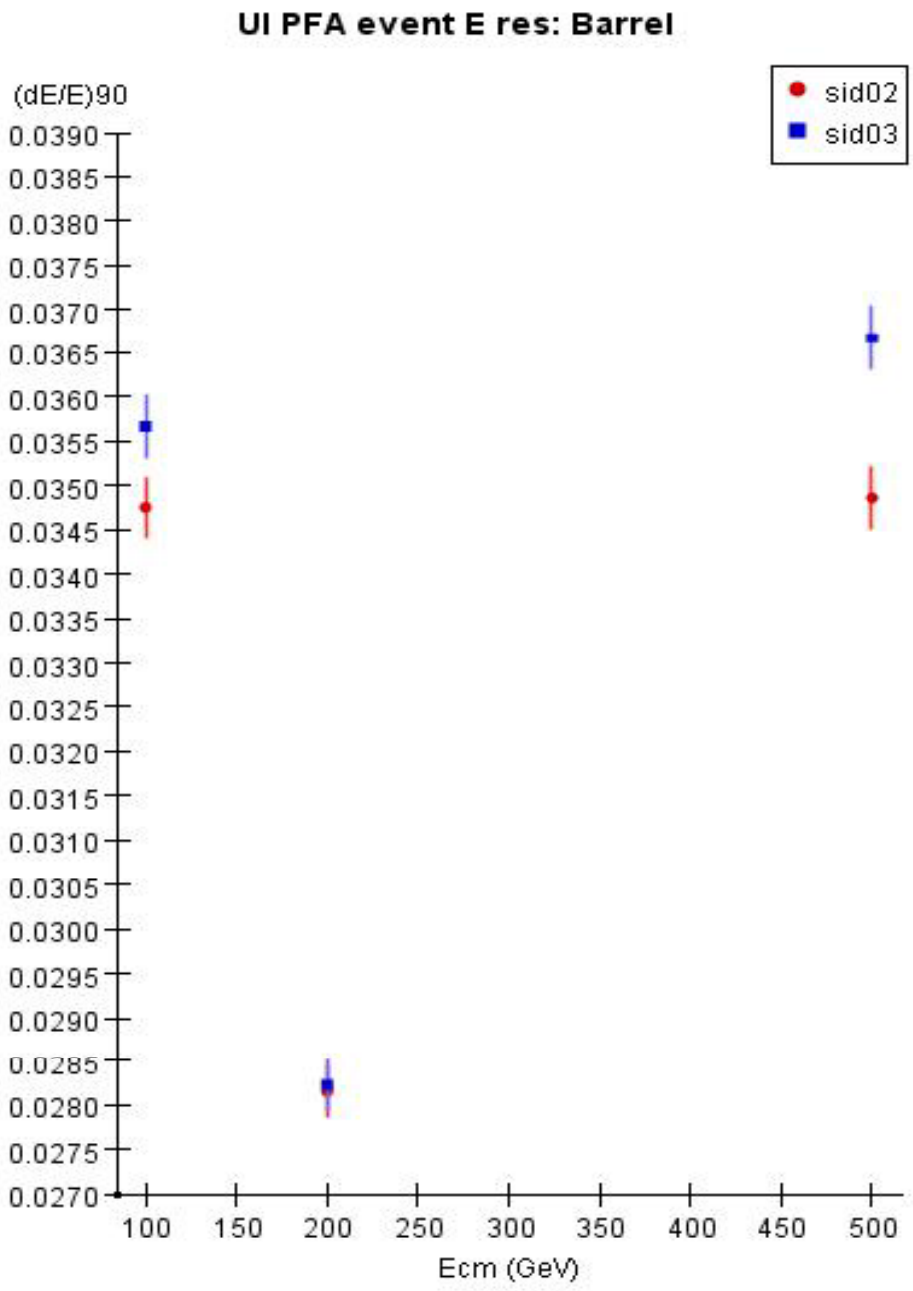
Calorimeter only Energy resolution (with muon system)

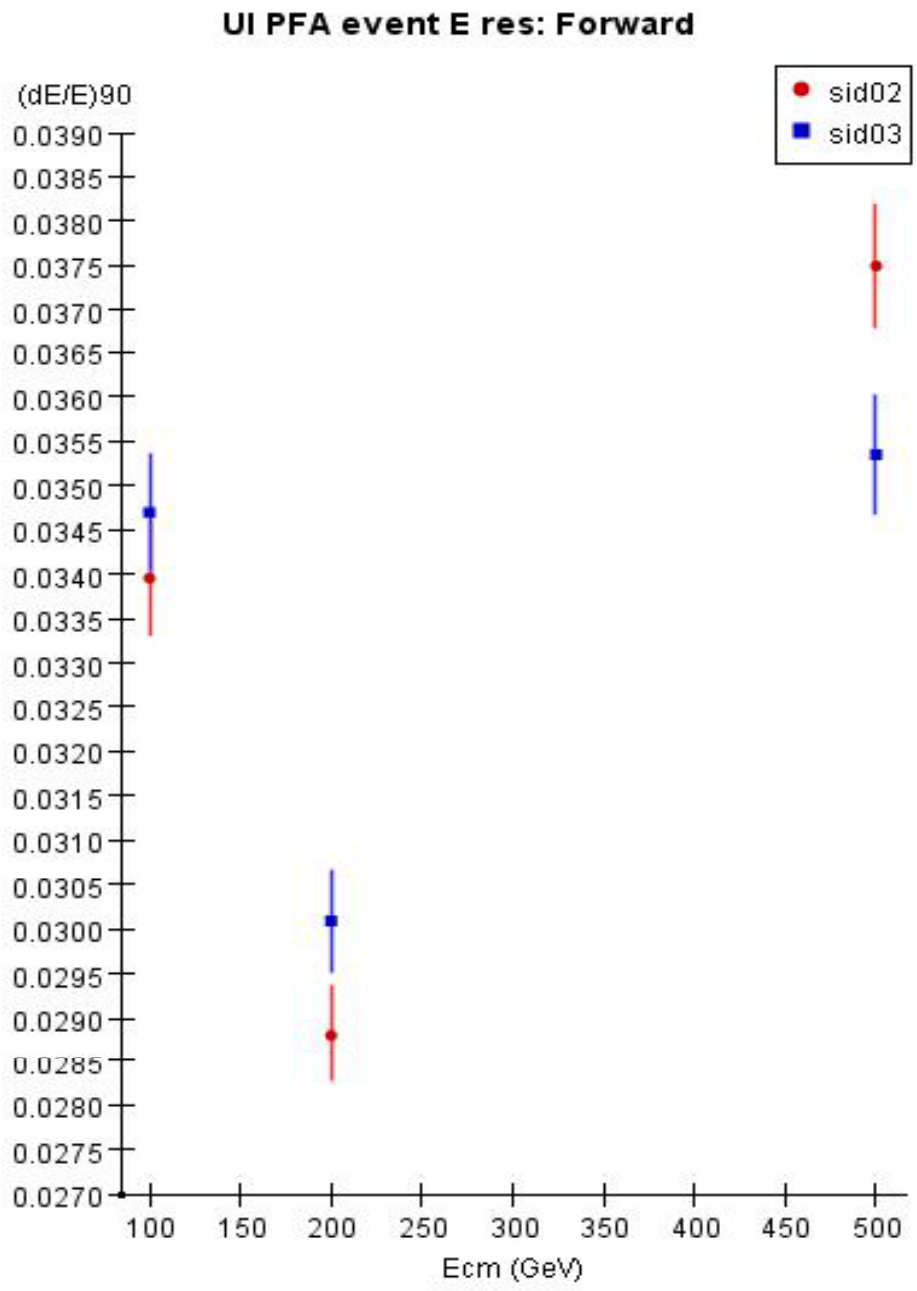





PPR event E res: Barrel
(dE/E)90
sid02
sid03
0.0175
0.0170
0.0165
0.0160
0.0155
0.0150
0.0145
0.0140
0.0135
0.0130
0.0125
0.0120
0.0115
0.0110
0.0105
0.0100
100
150
200
250
300
350
400
450
500
Ecm (GeV)


PPR event E res: Forward
(dE/E)90
sid02
sid03
0.0175
0.0170
0.0165
0.0160
0.0155
0.0150
0.0145
0.0140
0.0135
0.0130
0.0125
0.0120
0.0115
0.0110
0.0105
0.0100
100
150
200
250
300
350
400
450
500
Ecm (GeV)


UI PFA event E res: Barrel
(dE/E)90
sid02
sid03
0.0390
0.0385
0.0380
0.0375
0.0370
0.0365
0.0360
0.0355
0.0350
0.0345
0.0340
0.0335
0.0330
0.0325
0.0320
0.0315
0.0310
0.0305
0.0300
0.0295
0.0290
0.0285
0.0280
0.0275
0.0270
100
150
200
250
300
350
400
450
500
Ecm (GeV)


UI PFA event E res: Forward
(dE/E)90
sid02
sid03
0.0390
0.0385
0.0380
0.0375
0.0370
0.0365
0.0360
0.0355
0.0350
0.0345
0.0340
0.0335
0.0330
0.0325
0.0320
0.0315
0.0310
0.0305
0.0300
0.0295
0.0290
0.0285
0.0280
0.0275
0.0270
100
150
200
250
300
350
400
450
500
Ecm (GeV)

Summary

- sid03 is a better approximation to sid concept.
- For 250 GeV jets, ~ 5% difference between sid02-sid03.
- Many events already simulated using sid02: consequences of redoing with sid03?
- More detailed checks of both needed to assure no blatant errors.
- We need a decision