SiW ECAL analysis status

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- practice on 2006 data
- preliminary look at 2007 data
- future plans

reproduce 2006 analysis

Same event selection as used previously

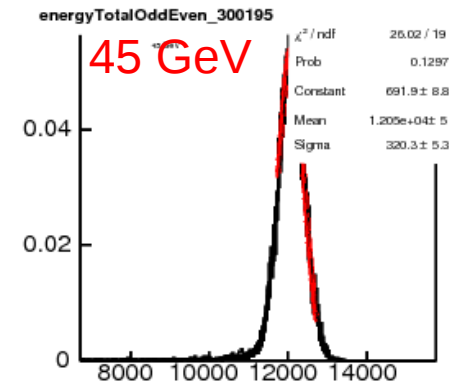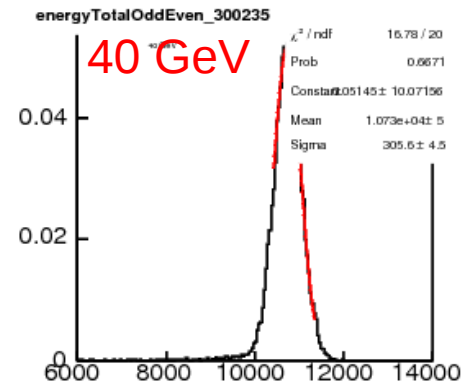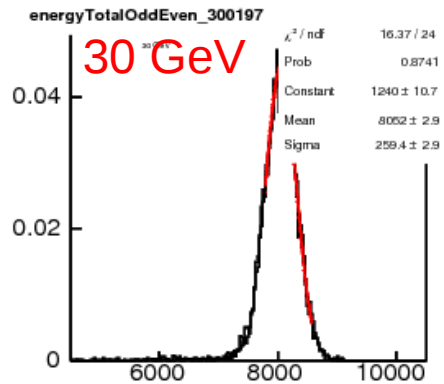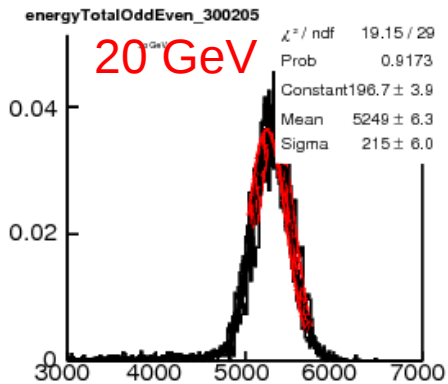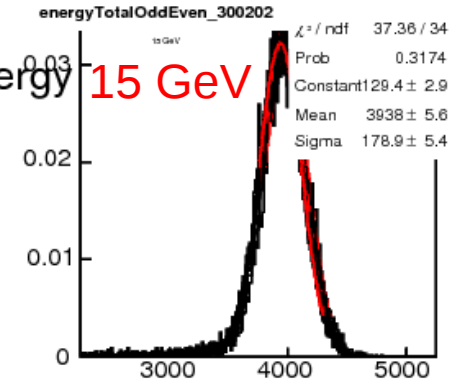Look only at region in centre of wafer, normal incidence
(shower barycentre)

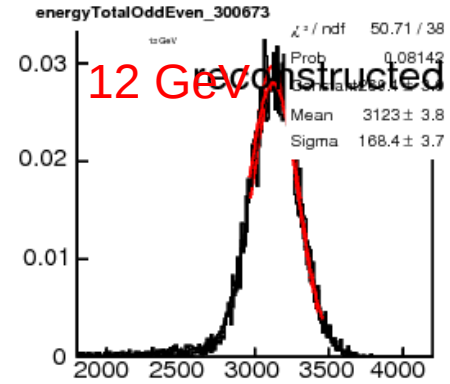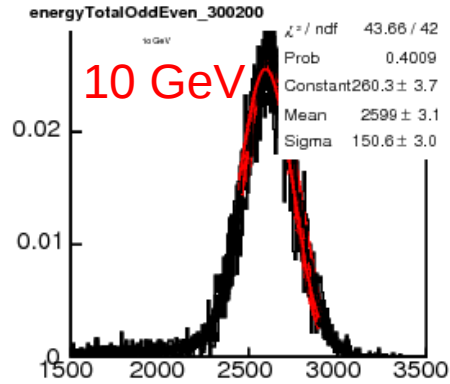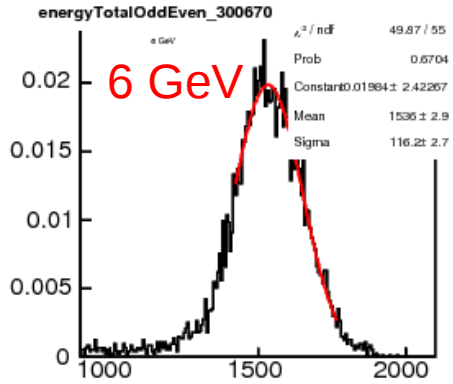Loose energy requirement
Reject pions, muons, double electrons

Shower shape requirements
Reject electrons interacting upstream

Remove beam halo

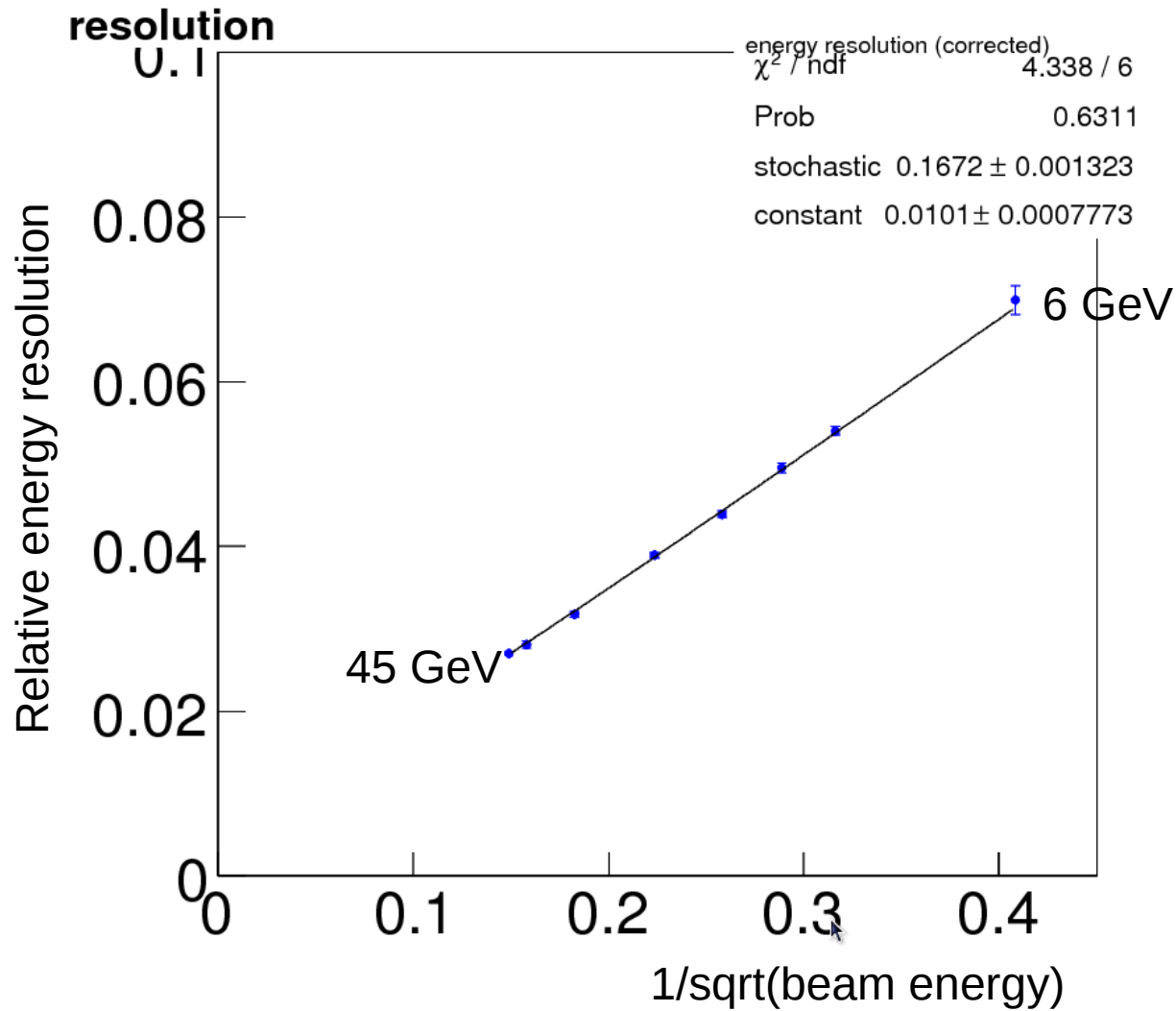Cerenkov signals when available

Energy distributions for 2006 data

Reconstructed energy / MIPs

Everything looks fine

Measured energy resolution (2006 data)

Results very consistent with previous analysis of same data
(Cristina, David Ward et al)

Improvements in Mokka model of SiW ECAL physics prototype

30 GeV e-

Black = 2006 data
Blue = original g10
Red   = new g10+Cu

Include copper fraction in PCB
    Fraction chosen to give correct density
    ~13% by volume, 43% by mass
    (Gabriel Musat)

This change gives significant improvement in simulation of longitudinal energy profile

e.g. 2006 electrons @ 30 GeV

Also recently some small improvements to Carbon Fibre description: ~zero change
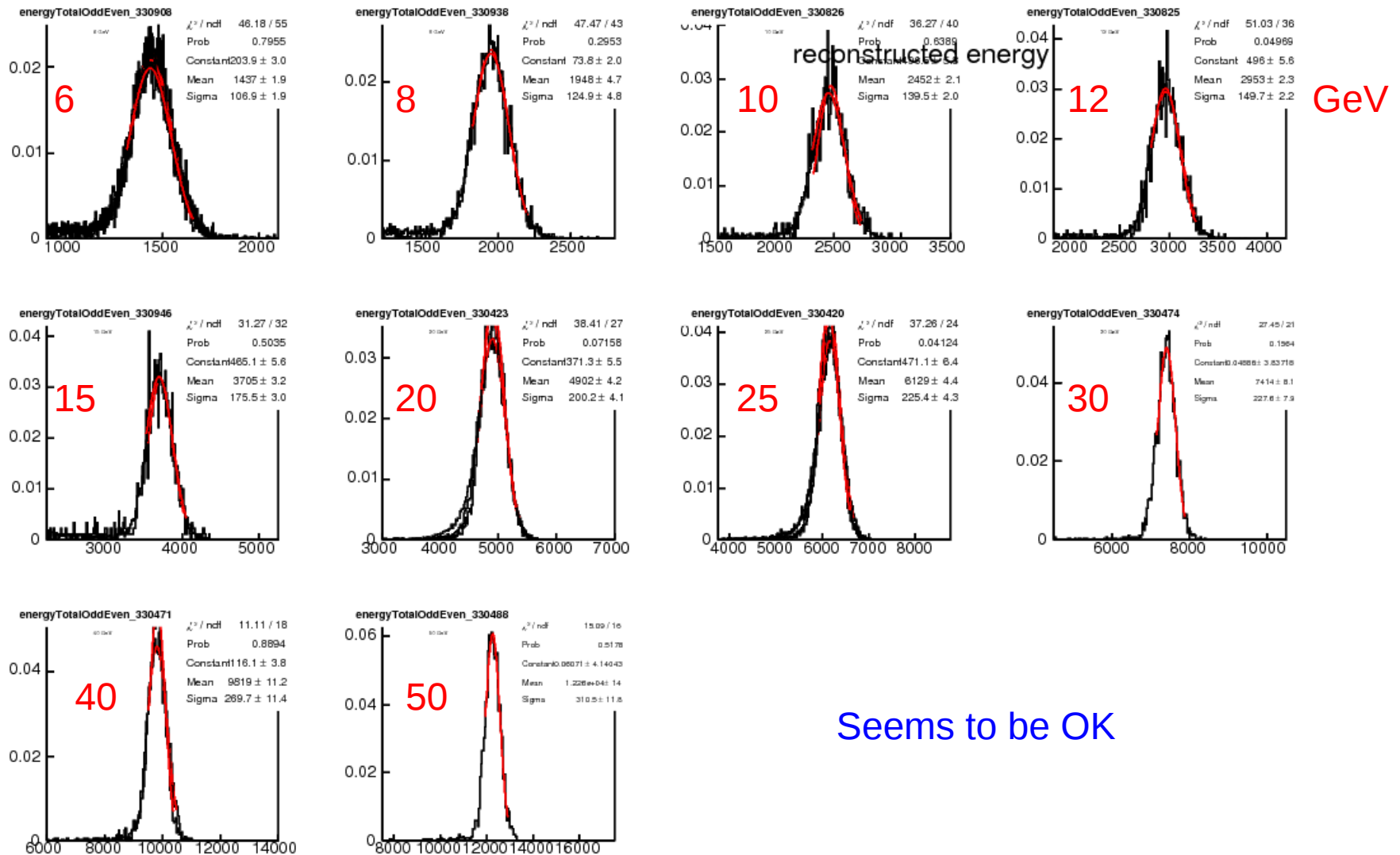

longprofile_900001

Entries	30
Mean	13.49
RMS	4.919

Normalised energy deposit

ECAL layer

Preliminary look at 2007 data

Reconstructed energy [MIPs]

Seems to be OK

residual

100

50

0

-50

-100

Residuals [MIPs]

0   20   40

Beam energy [GeV]

Black: run-by-run
Blue: energy average

Uncertainties meaningless

Energy linearity & resolution
2007 data
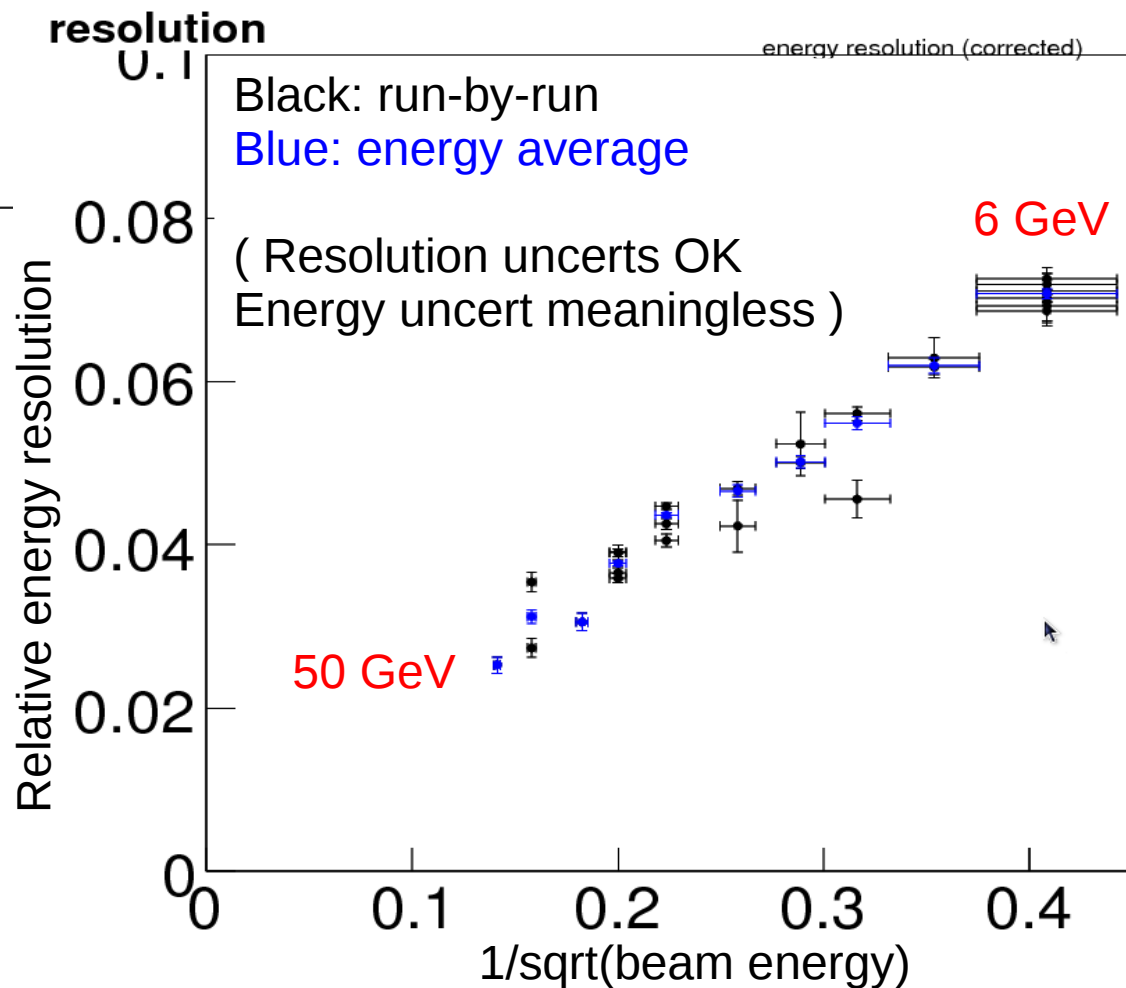
Preliminary observations

Linearity looks good to ~1%

A few things to understand
in the resolution

resolution

0.1

0.08

0.06

0.04

0.02

0

Relative energy resolution

0   0.1   0.2   0.3   0.4

1/sqrt(beam energy)

energy resolution (corrected)

Black: run-by-run
Blue: energy average

(Resolution uncerts OK
Energy uncert meaningless)

6 GeV

50 GeV

Future plans

Continue analysis of 2007 data
    - add study of gaps, angles (some alignment issues, now solved (?))

Results after realistic photon/electron clustering
    - GARLIC algorithm (Marcel) applied to ILD simulation, test-beam
data & simulation

Once calibrations for 2008 data are available, repeat analysis

Working on commissioning of tracking system for 2008 data
    - multiple scattering characterisation, alignments...
    - help from Paul Dauncey

This will allow us to measure ECAL position and angular resolution

Conclusions

Working copy of 2006 analysis

Preliminary results of 2007 data
-still more work do be done

Develop analysis into new directions
Apply to 2008 data