## Open issues in APD analysis

No (unfortunately) progress in APD analysis

#### Status:

- As it was presented by Hendrik in Durham (energy linearity and resolution + new phys. MC)
- Consistency between different data taking
- Good agreement among data of PD and MC
- No systematic uncertainties applied
  - ... these weeks work

### Next plans: study of systematic errors (1)

Open points, namely (according to Gerald's email):

- Beam spread
  - about 3% of beam energy, no problem applied
- Reproducibility of results on calibration and energy scan
  - mainly for MIP calibration
  - many data sets to compare (diff. HV, gate, T)
  - sometimes taken 2-3 files with same conditions (negl. temp.  $\sim$ 0.1K)  $\rightarrow$  stability of calibration
  - fit procedure: choice of intervals (simple gauss), strange behavior of fit (gauss + landau)

## Next plans: study of systematic errors (2)

← influence of pedestal in data trigger mode (low S/N)

- $\leftarrow$  showering: other peaks in landau tail
  - → shift of MIP<sub>MPV</sub> position (cuts on pedestal, showering events, can be optimized and estimated in MC)
- Effects of temperature, HV
  - monitoring of APDs with slow control
  - relative corrections from LEDs (presented as trigger mode), should be corrected to PIN response

# Next plans: study of systematic errors (3)

- Second particle contamination
  - influence in gauss fit on energy sum (low energy)
  - question how to determine?
  - no trigger on multi particle detection
  - distribution depends tile to tile, on beam energy
  - some estimation from MC (ratio to 1 particle response)?
- Others:
  - light collection homogeneity in tail (beam shift, data taken 1.5cm)
  - effect of summing 3 tiles vs. 1 tile for central and outer tiles (??)
  - pedestal stability, ADC stability, ...