NOISE

• What is noise?
  (without speaking about pile-up)
• tsim_l1cal2b
• ADF simulation
• Signal processing (thermal noise)
tSIM_l1cal2b

- ad hoc noise added to each trigger tower (input to TAB)
- Jovan’s conclusions are based on that
ADF simulation

• “white” noise added every ns to the generated puls
• suppressed by analog filter by a factor of 8
• not much of it left at the end
<0.25 GeV>/ns propagated through ADF
<2 GeV>/ns propagated through ADF

**Generated**
- Nent = 132001
- Mean = -0.0068
- RMS = 2

**Filtered**
- Nent = 132000
- Mean = -0.0068
- RMS = 0.26

**Digital Filter**
- Nent = 997
- Mean = 0.043
- RMS = 0.11

**Result**
- Nent = 997
- Mean = 0.023
- RMS = 0.072
Thermal noise

- W.E. Cleland, E.G. Stern: Signal processing…
  NIM A 338 (1994) 467 – 497
- Gaussian amplitude distribution
- Poisson distribution to find number of pulses in each BC
- Multiplied by h´(t)
  (h(t) is the impulse response)
Questions

• add random values at some \( t \) and where?
  - to the generated pulse
  - after the analog filter
  - to the ADC samples

• which amplitude?

• propagate using an impulse response or not?
  (and which impulse response)

• information from zero-bias trigger?