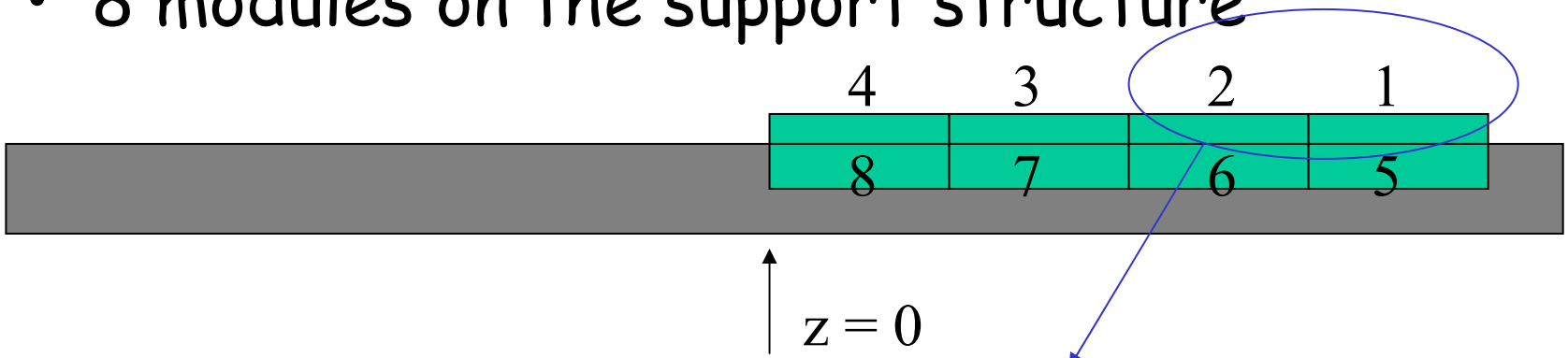
Pedestal Splitting

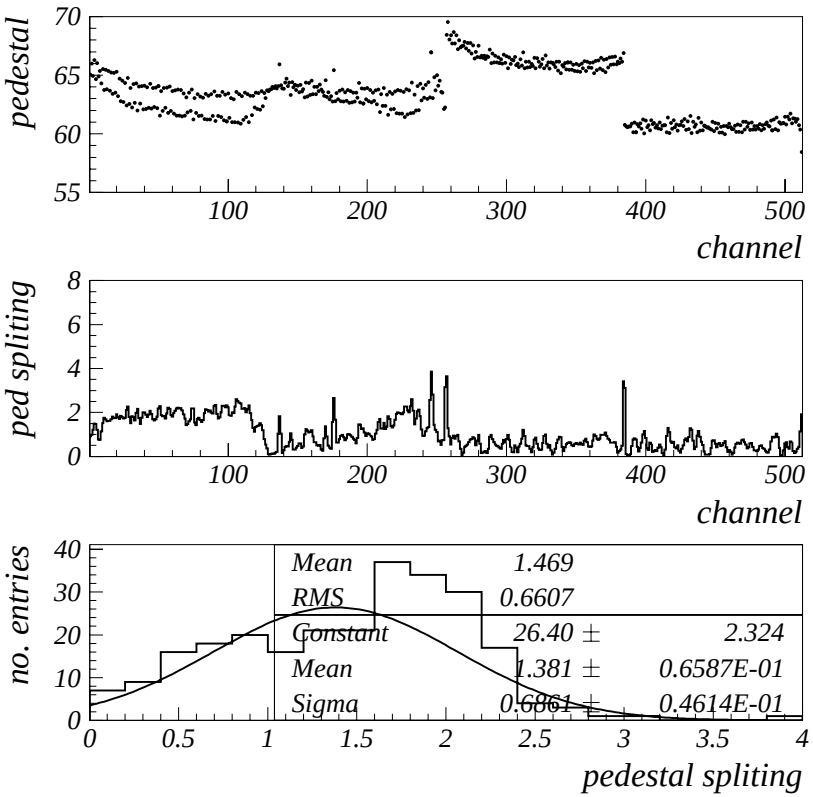
- 8 modules on the support structure



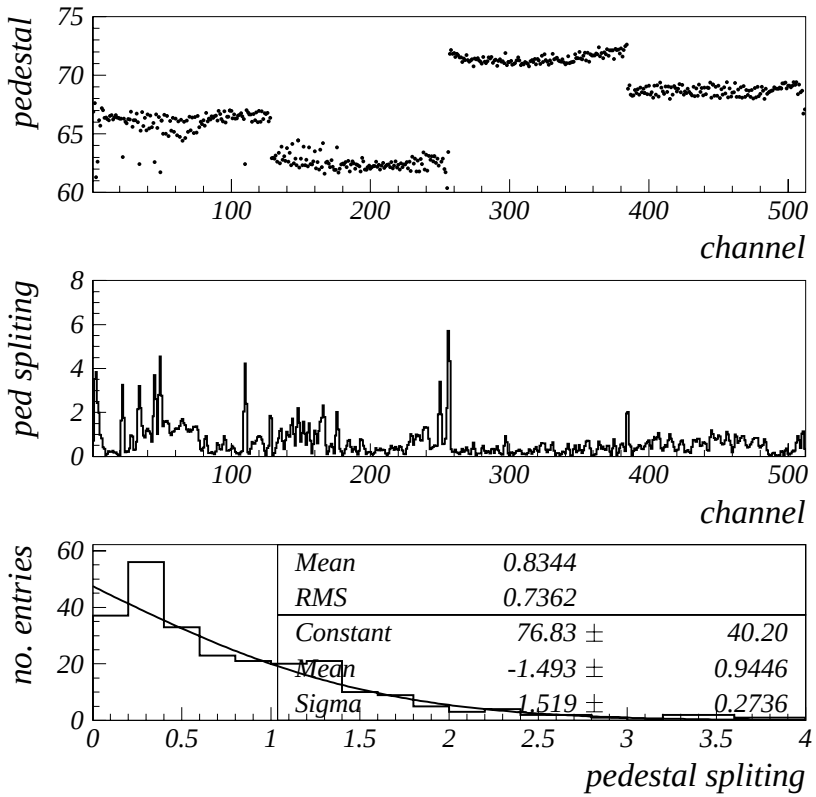
- Read out only 1 and 2 in this study
  - We know cal_sr in 2 has contribution to 1
- HV = 50 V
- BW = 4 with 132 ns integration time

Comparison with the run 2b L0

new L0



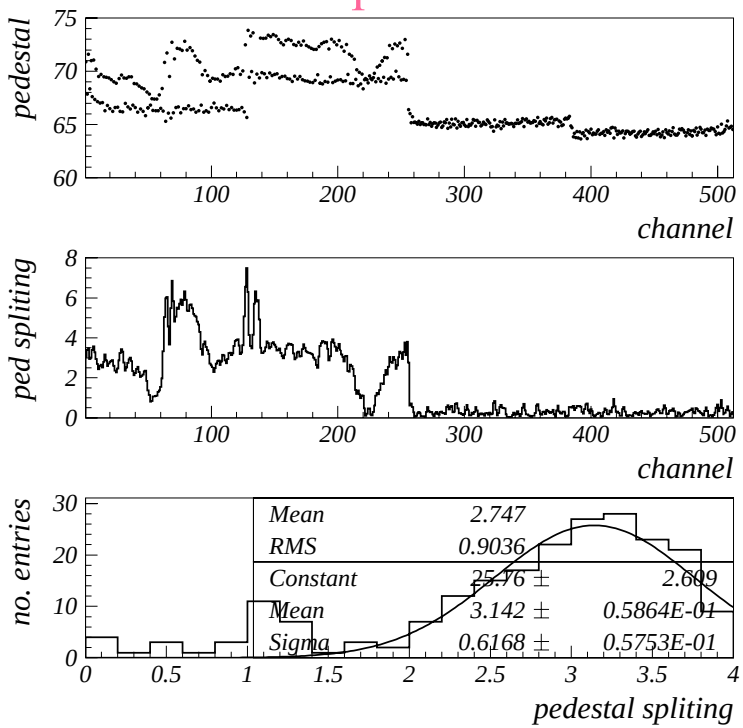
run 2b L0



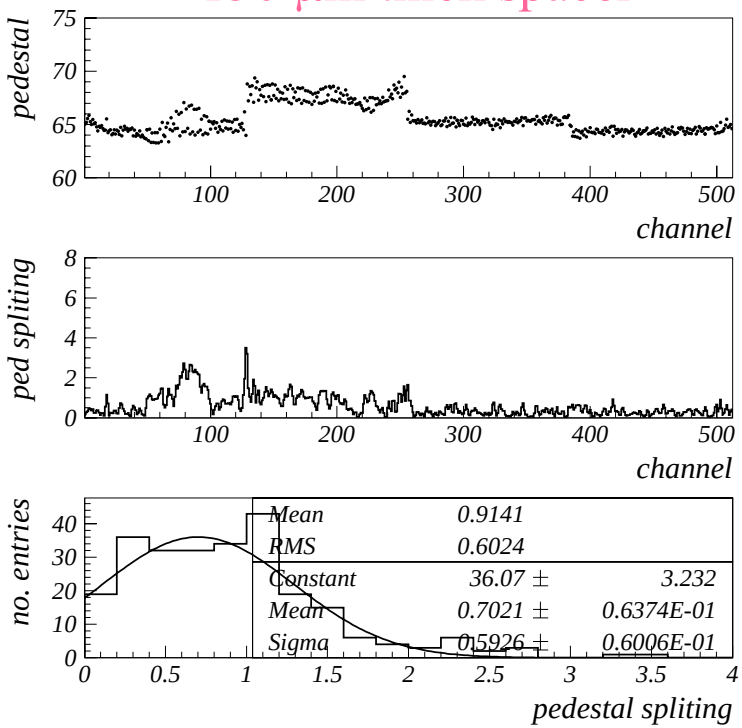
- run 2b L0 does not have the splitting, although there is tiny effect by cal_sr
  ← difference is the distance between hybrid and the analog cable underneath

Spacer between hybrid and analog cable

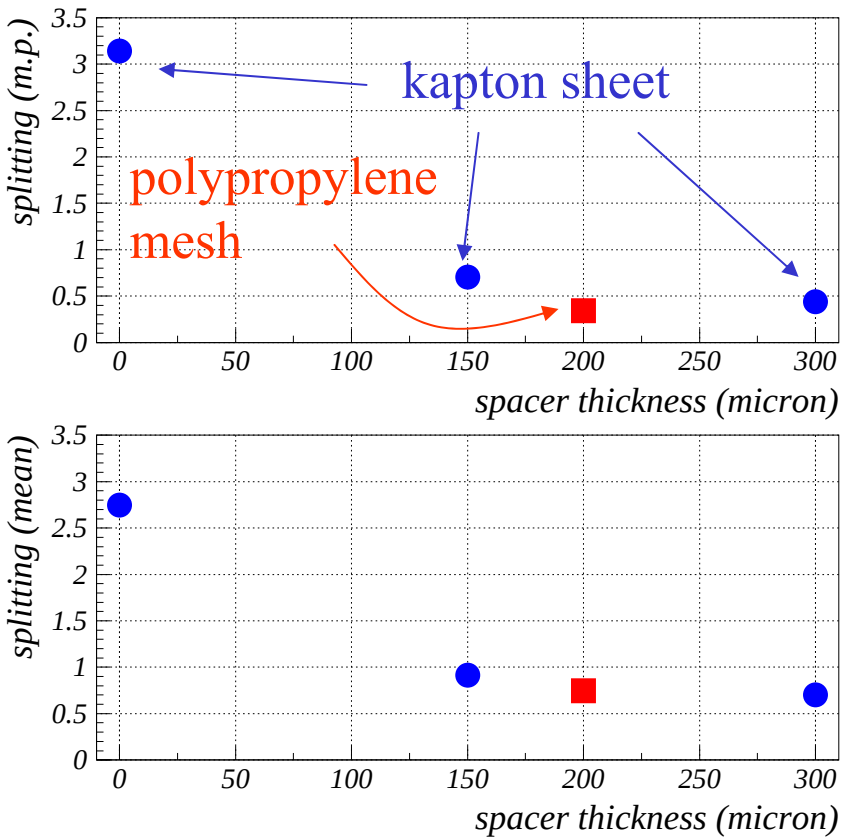
no spacer



150 μm thick spacer

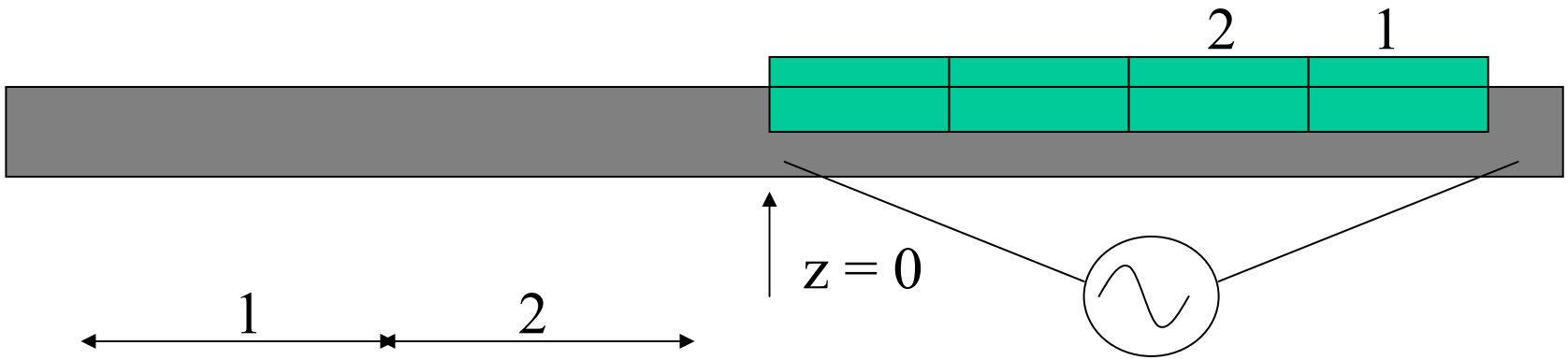


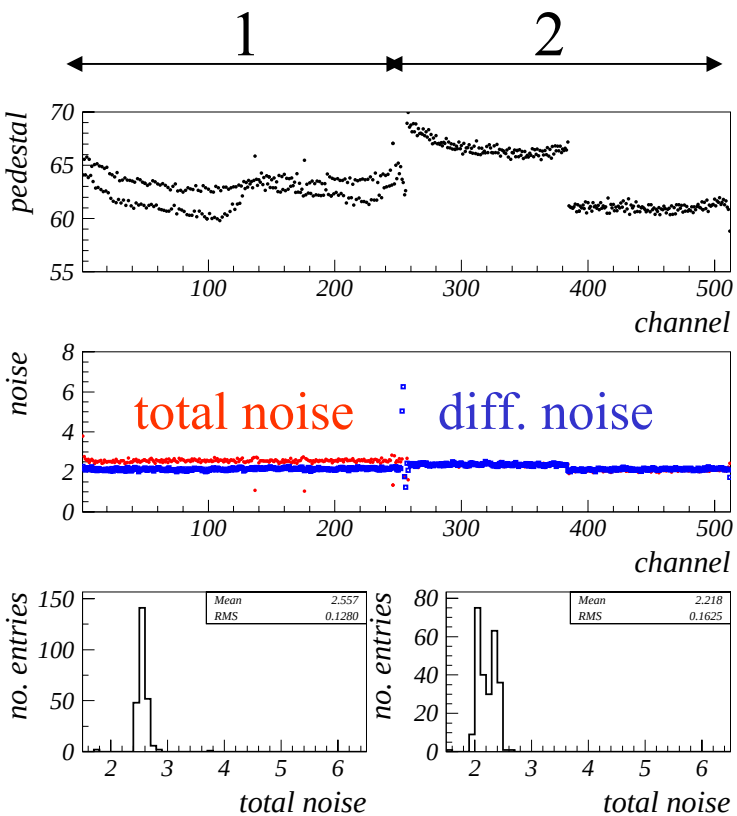
Dependence on spacer thickness



- clear dependence on the spacer thickness
- another measurement by Daekwang

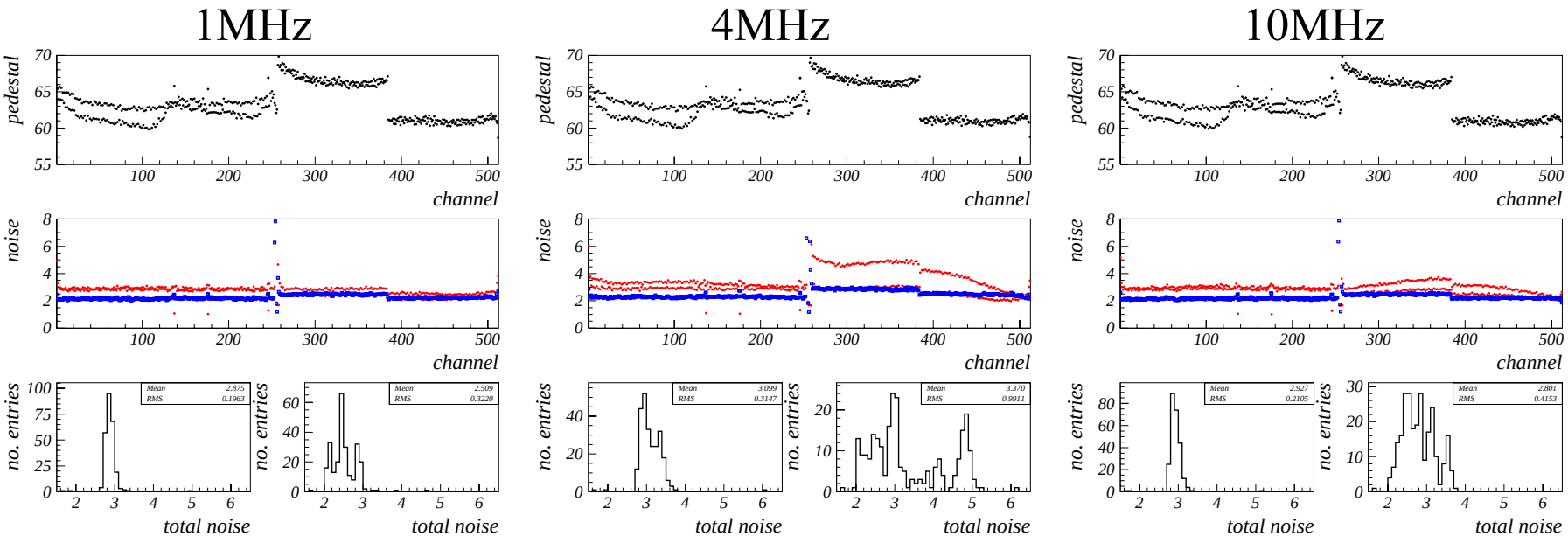
Noise study using pulse generator





- Pulse generator connected to the support structure through the copper mesh
- Due to the inductance of cables (?), there is small pickup on the module 1 without any pulse. See the left plot

Some measurements



- Larger effect
  - on module 2
  - on top analog cable in a module

➔ closer to the support structure, effect is smaller

- Real time pedestal subtraction removes this coherent noise completely

Summary

- Pedestal splitting
  - coupling between analog cable and hybrid, on top of the cal_sr
  - need some (~150μm?) space
- Noise study with pulse generator
  - effect is smaller when the frequency is <1MHz or >10Mhz
  - more detailed study by Daekwang
    - frequency dependence
    - amplitude dependence
  - closer the support structure, noise is smaller → two hypotheses
    - because of poor ground connection, actual ground comes from capacitive coupling of analog cable
    - ground loop among sensor, analog cable, hybrid and support structure
  - testing with single point ground at sensor side will decide the correct theory