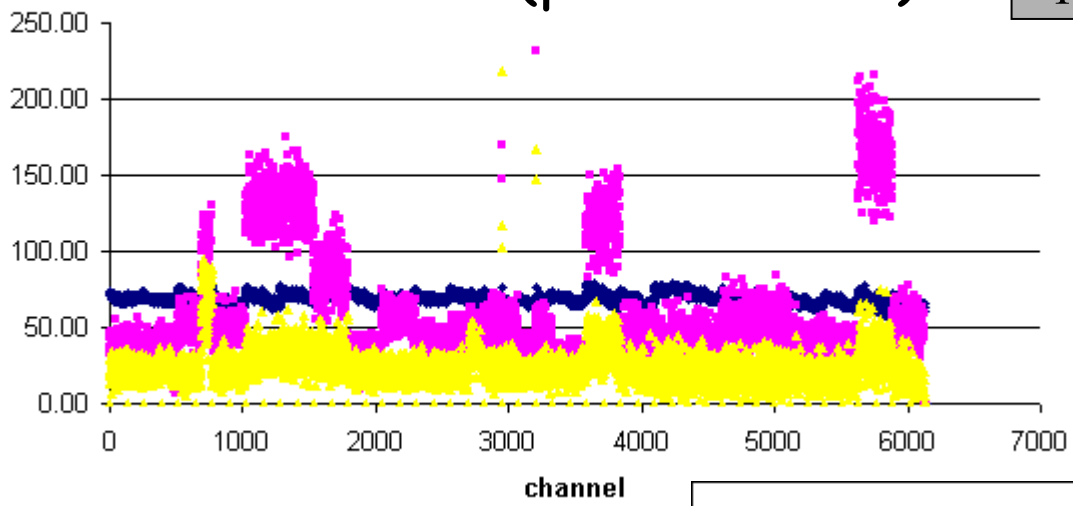
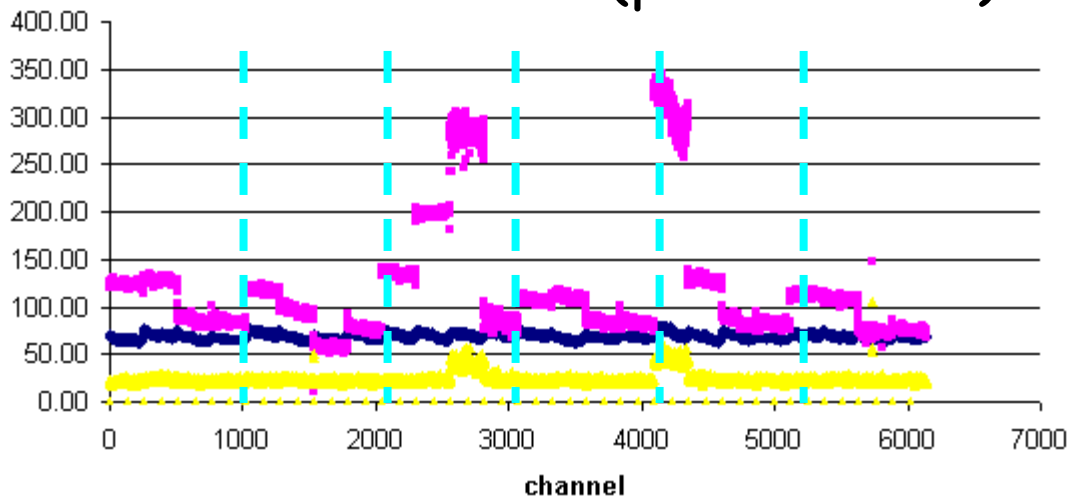
Noise at default

chiller side (position 5-8)

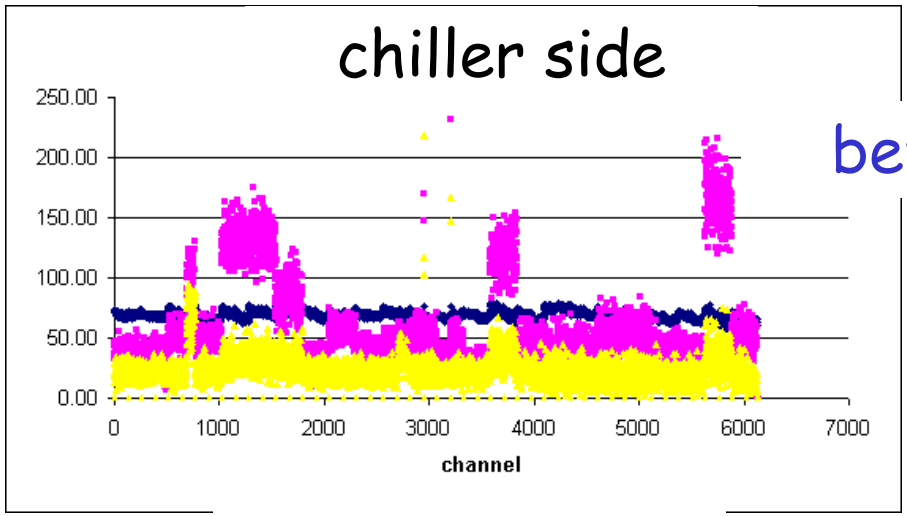


1	2	3	4	5	6	7	8

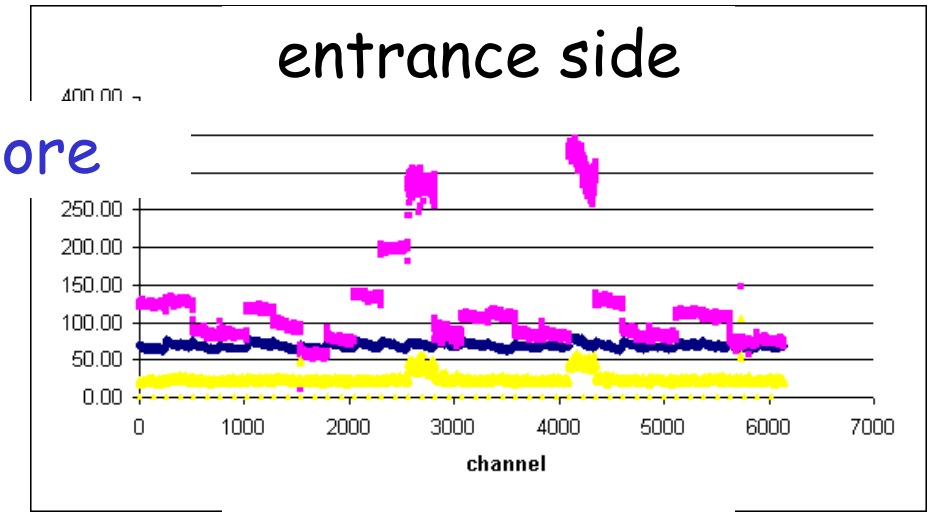
entrance side (position 1-4)

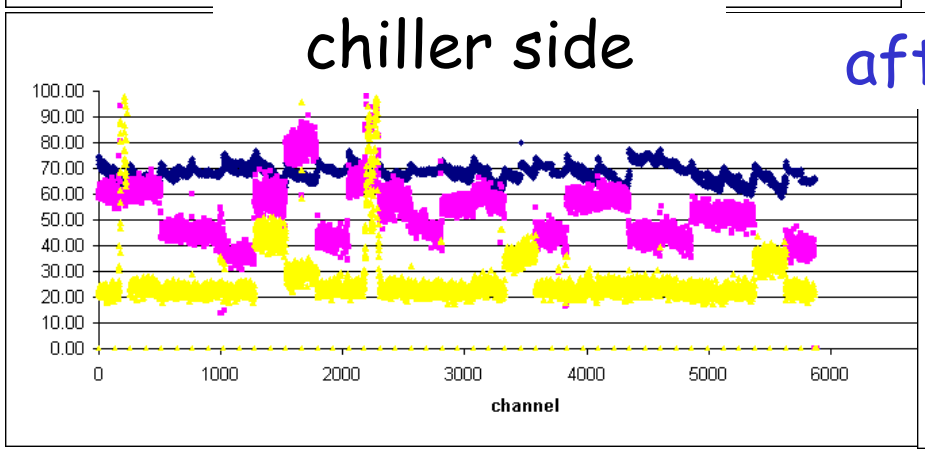


Rerouting power line

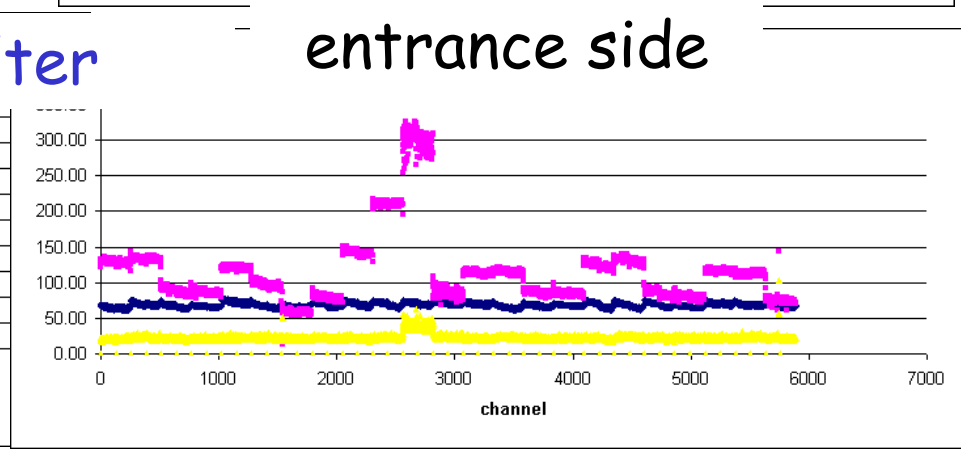


before



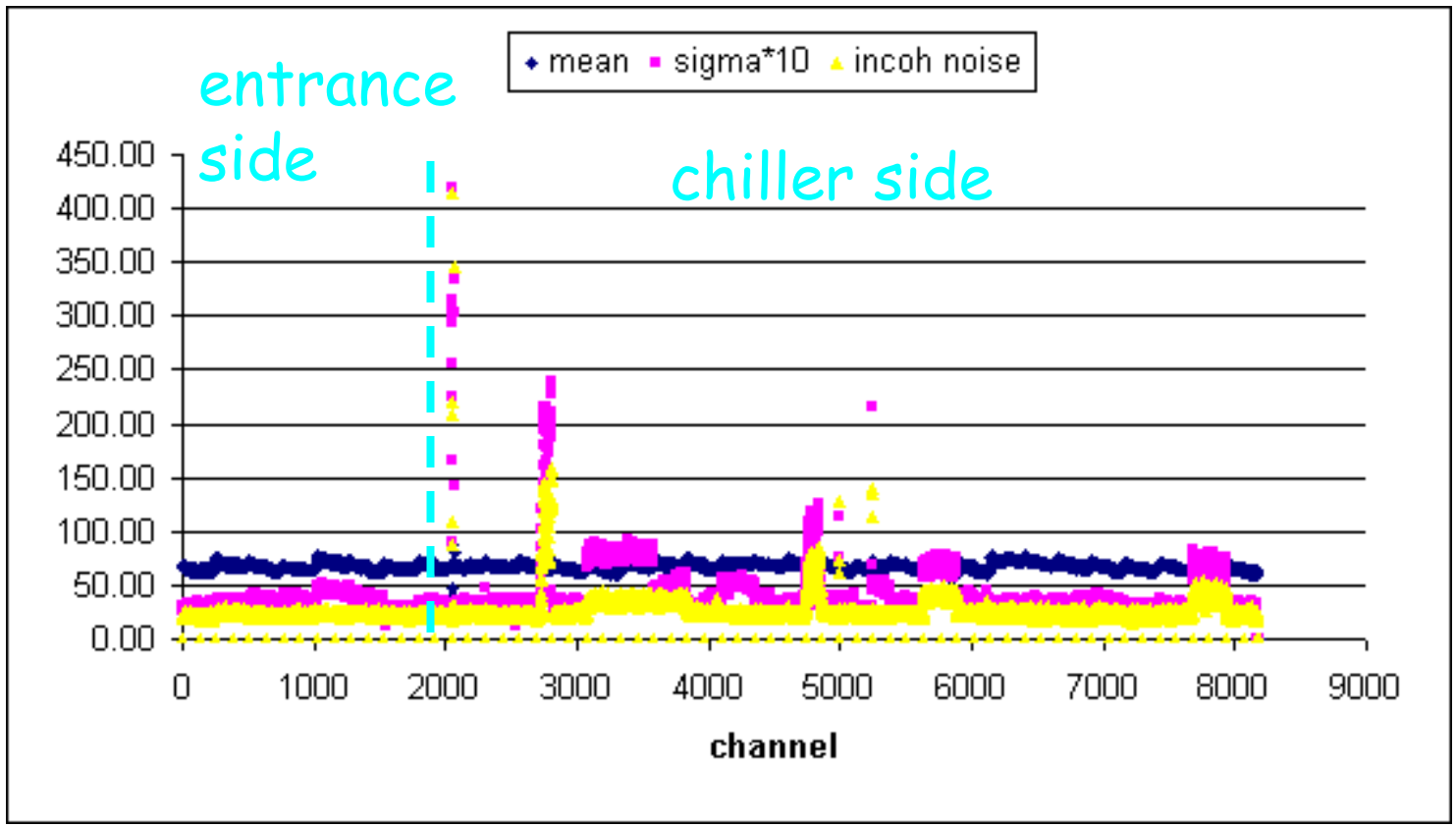


after



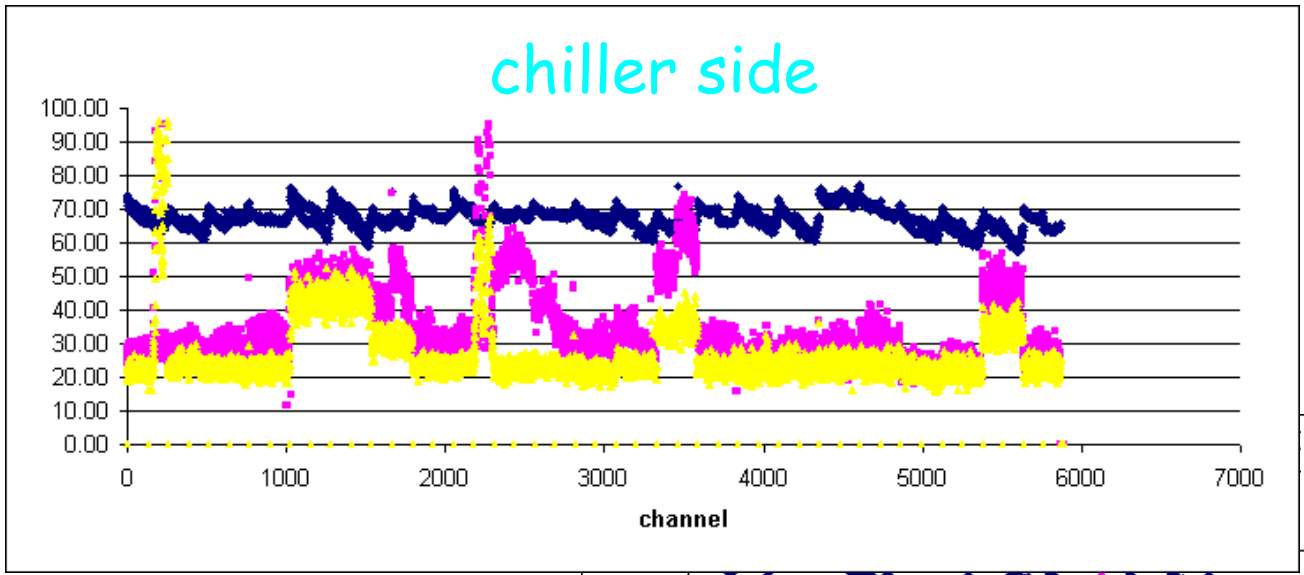
- No effect on entrance side
- Became worse on chiller side

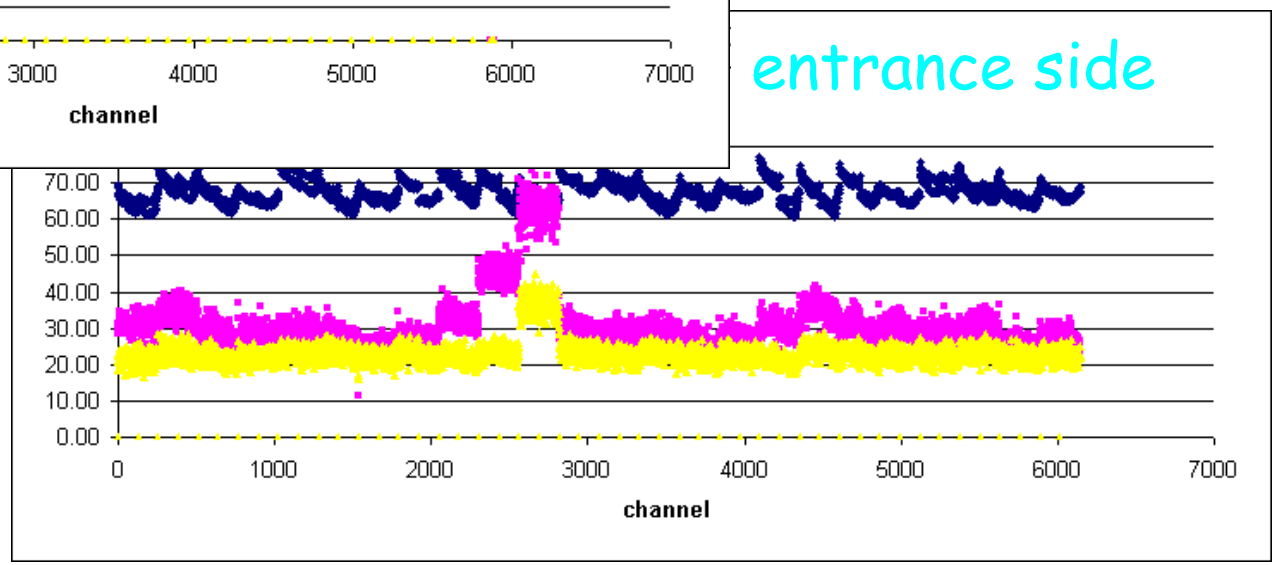
Shorted isolate and common GND



- Noise is gone --- consistent with the result at the electrical test structure

Ferrite into power line near AC





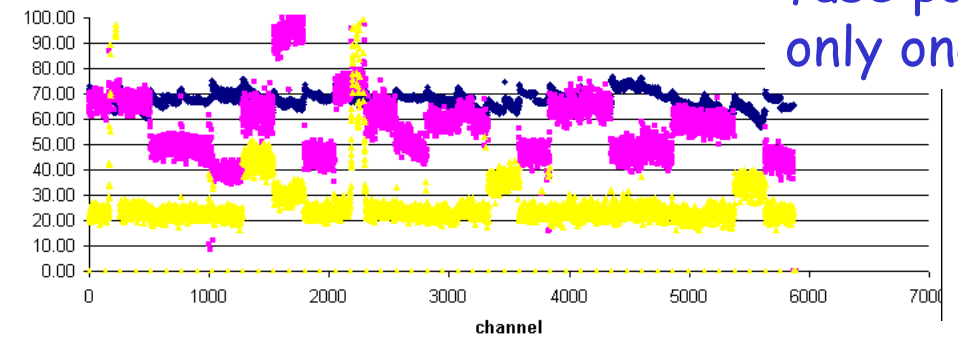
- Noise is reduced --- consistent with the result at the electrical test structure

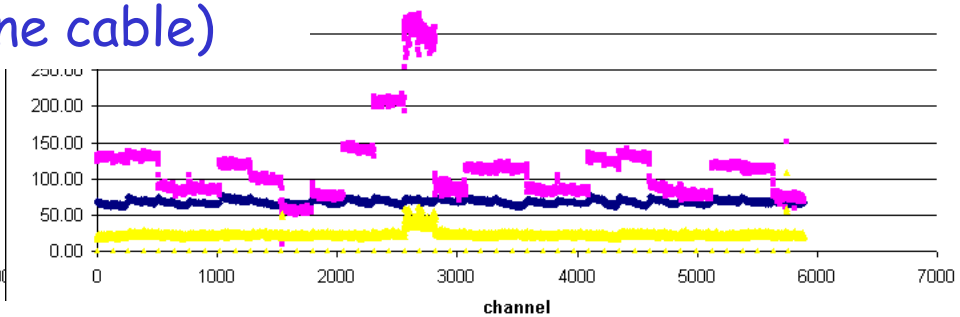
Where to put ferrite

chiller side

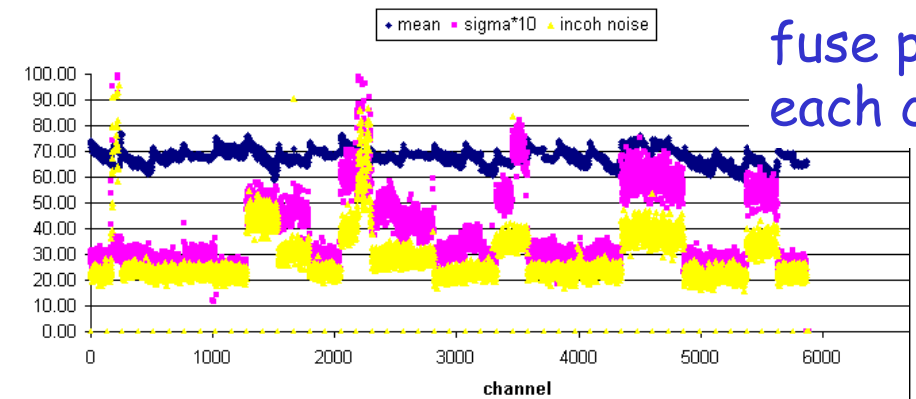
8 turns before fuse panel (for only one cable)

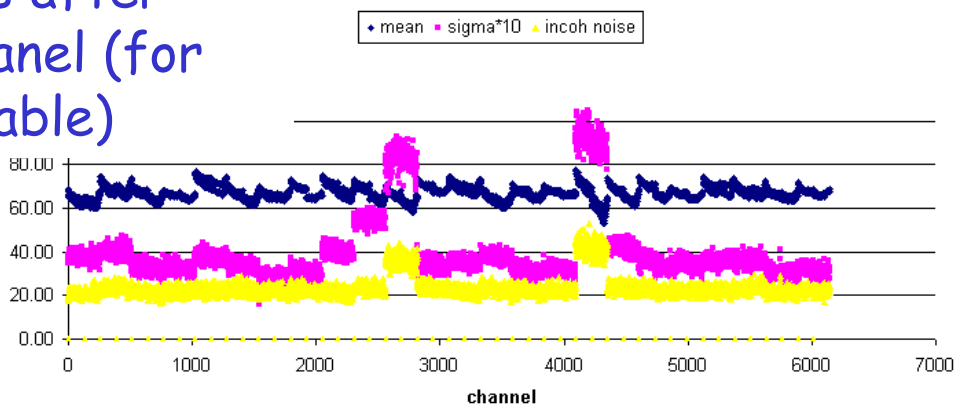
entrance side





6 turns after fuse panel (for each cable)





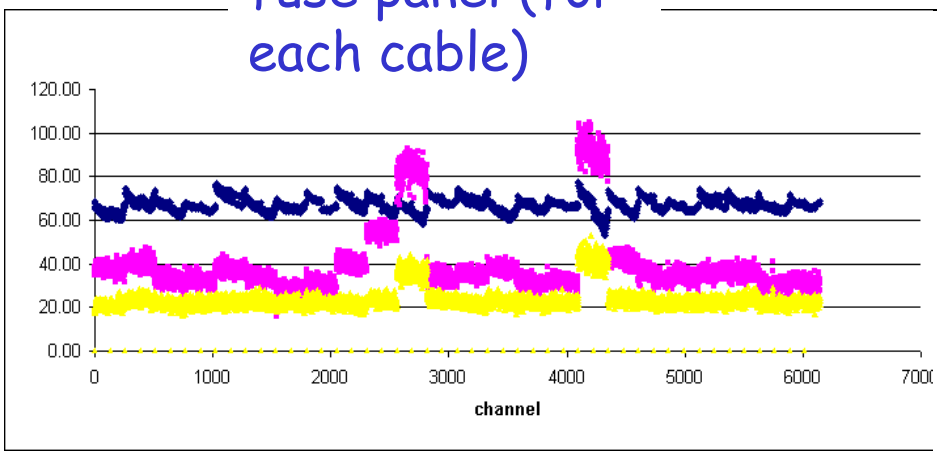
- Ferrite seems to work after fuse panel (effectively number of turns is different)

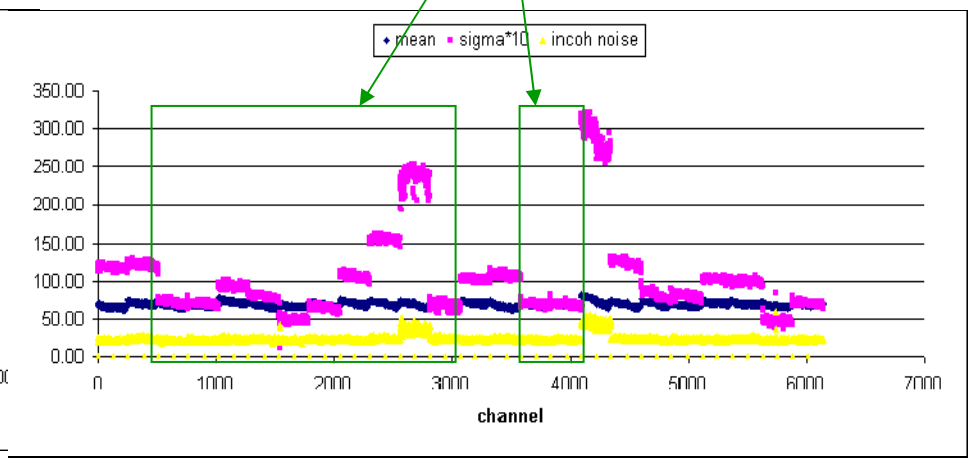
Shielding power line

6 turns after fuse panel (for each cable)

entrance side

ferrite removed, then covered with shield

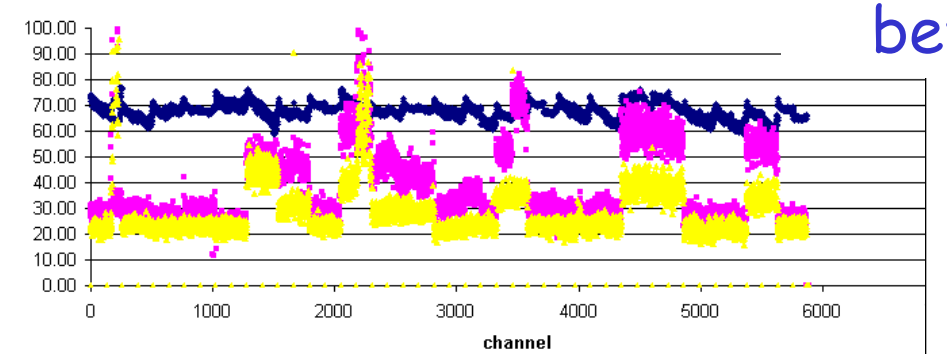




- Half of power lines are shielded (ferrites are removed for these lines)
  - Get worse, not only the corresponding AC but all AC's in the same side

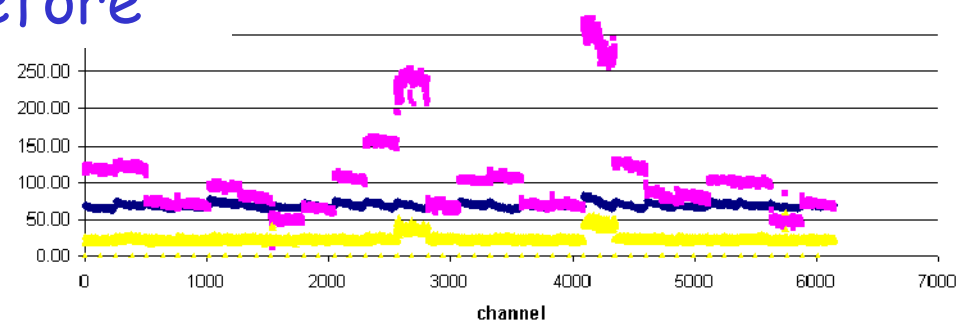
Swapping power supply (ferrite after fuse panel)

chiller side

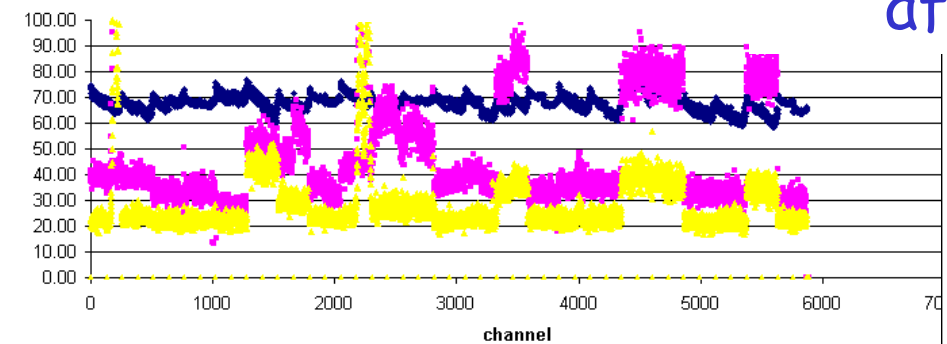


before

entrance side

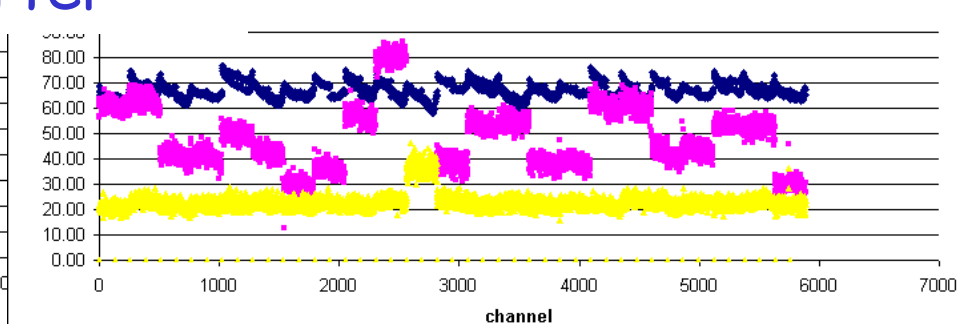


chiller side



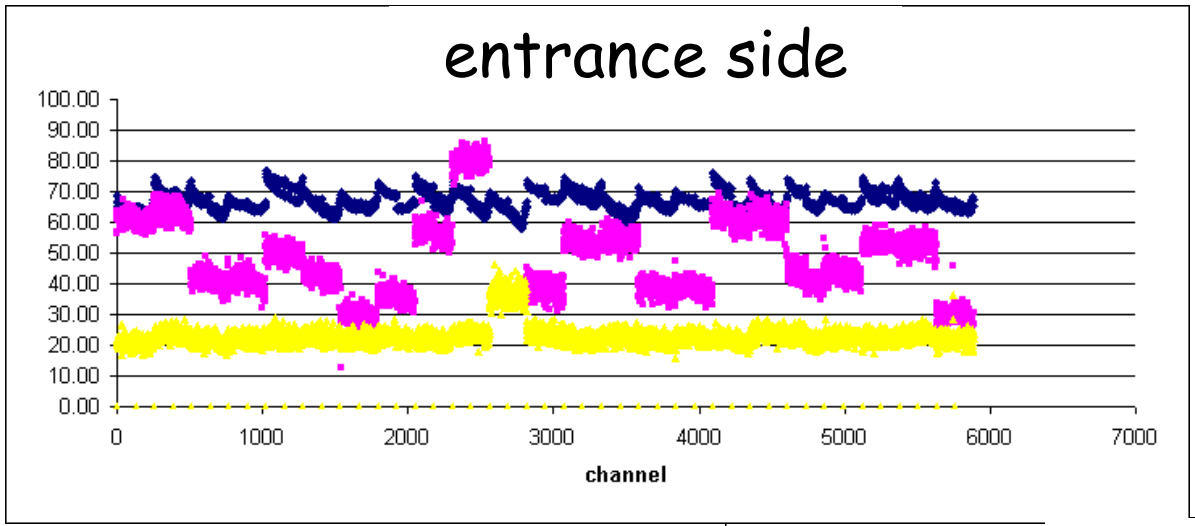
after

entrance side

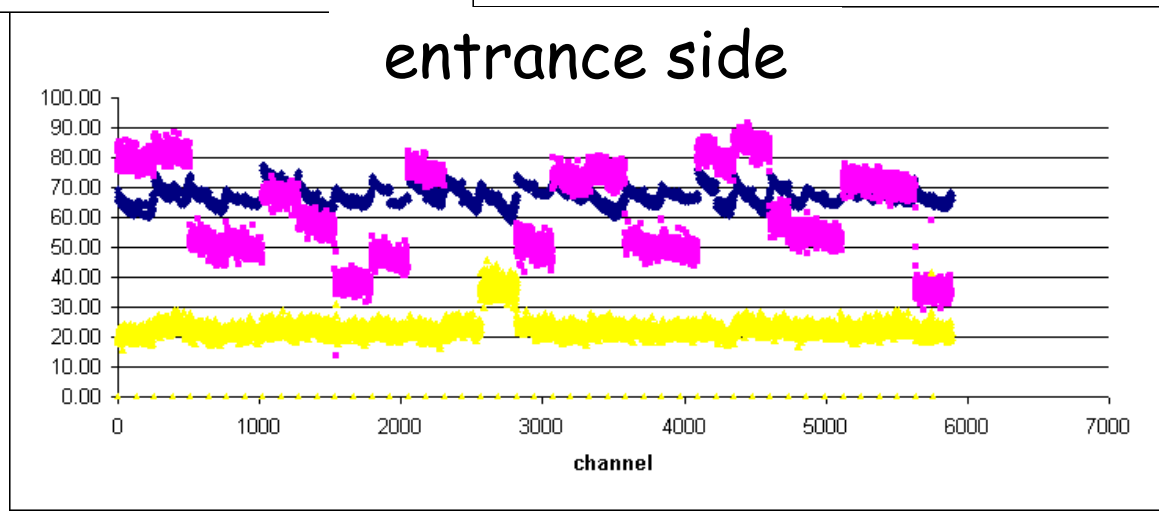


- Inputs to fuse panel are swapped ➔ changed
  - power supply and/or cables from PS to fuse

Effect of sense wires

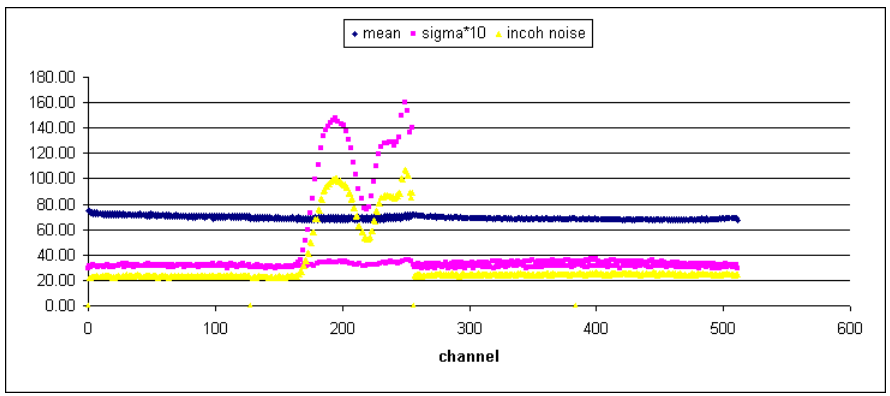


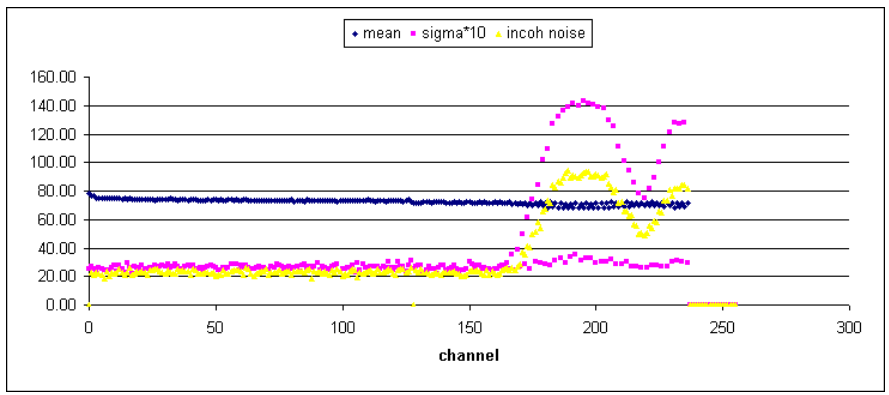
- Some effects, but no improvement so far

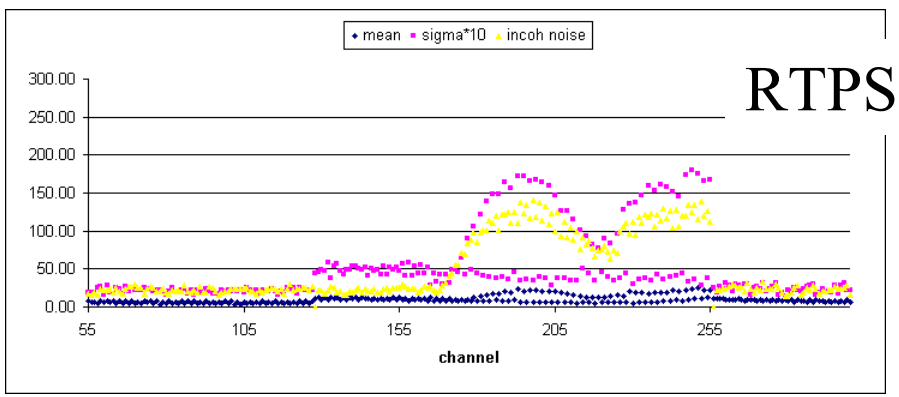


Noise related to RTD

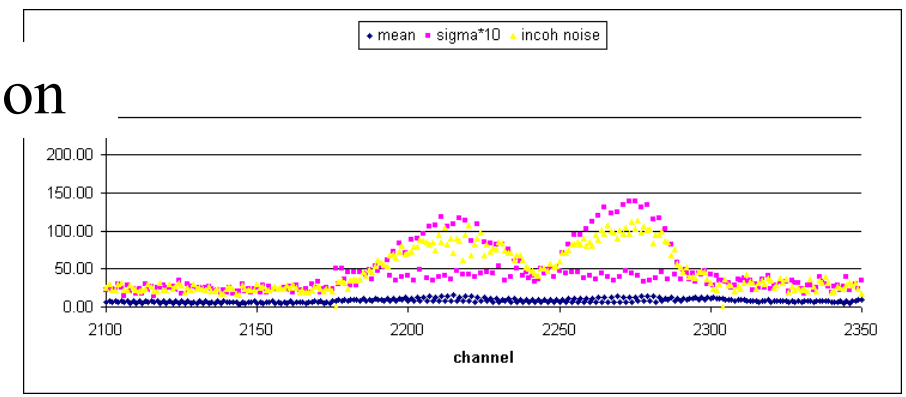
- Two modules see the noise image of RTD





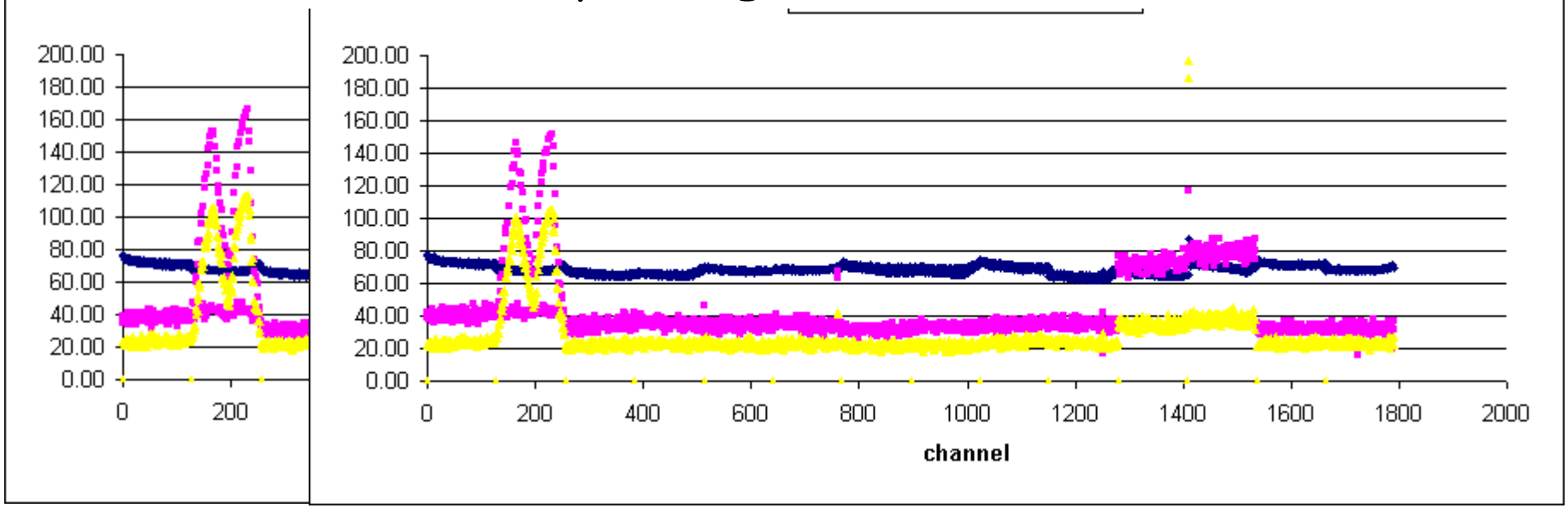


RTPS on



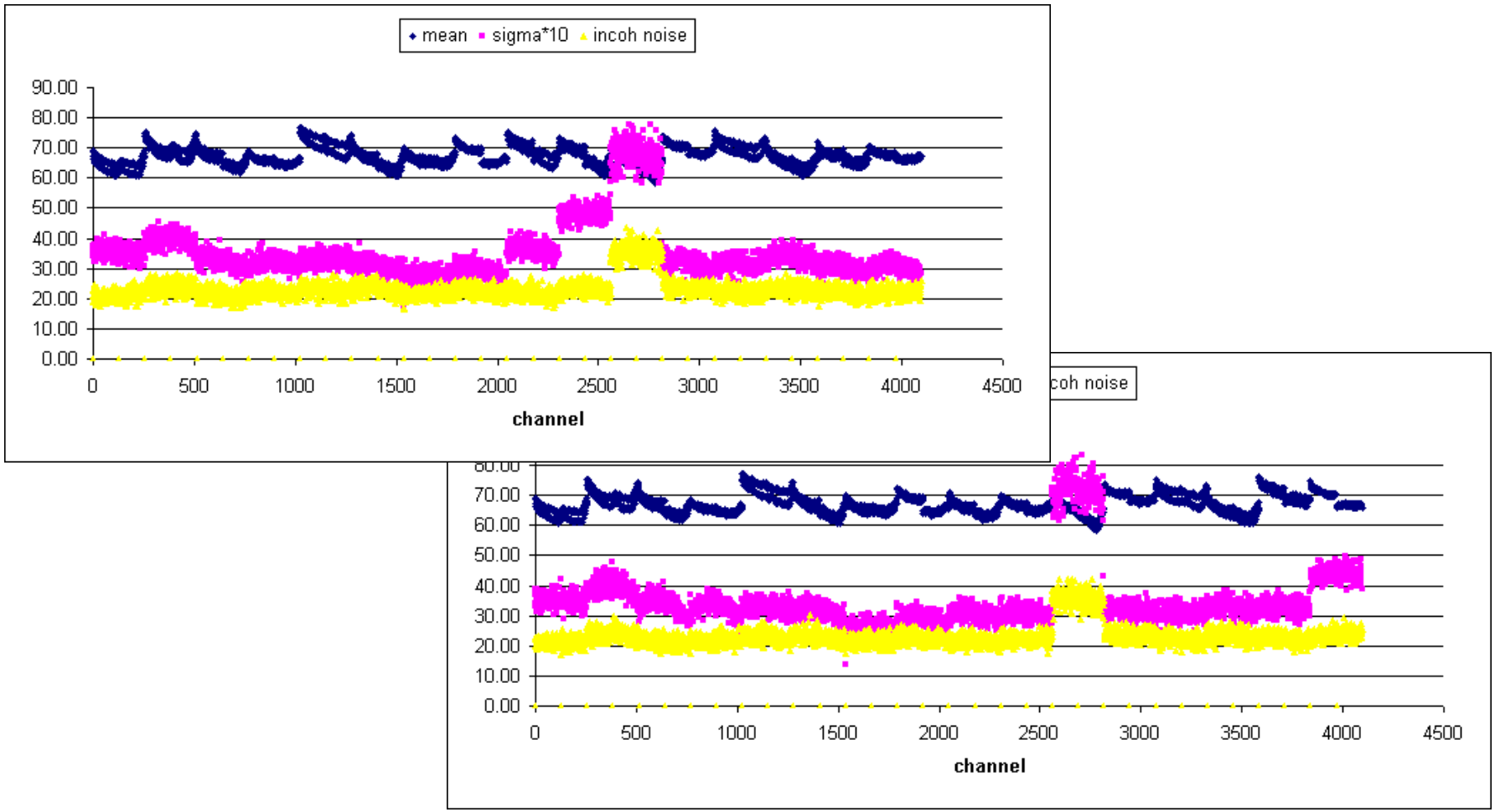
Effect of clock cable

before and after shielding clock and clock-bar cables of corresponding module



- Seems slightly better, but not significant
  - need to shied all the clocks???

Noisy module



- There exists a noisy module with unknown reasons

Summary

- Large pickup noise from the SVX4 power
  - shorted out isolated and common ground throw the noise away completely
  - ferrite helps to reduce nose
    - very consistent with the result obtained at the electrical testing support
  - power supply including the cables to fuse panel seems to be also culprit
- RTD noise still mystery
  - this is very crucial because RTPS does not help
- A few noisy module – another mystery
  - my suspicious on the poor connection of low-pass filtering capacitor on the sensor

Plan/Issues

- Investigation of noise image of RTD
  - again poor connection of low-pass filter (Marvin)?
- Bandwidth scan and HV scan (by shorting out the isolated and common GND)
  - I prefer to have new HV pods for HV scan
- Have to think about how we use ferrite in the collision hall
  - we shouldn't expect better noise at the collision hall because of the unknown effect from the cable route