
CERN

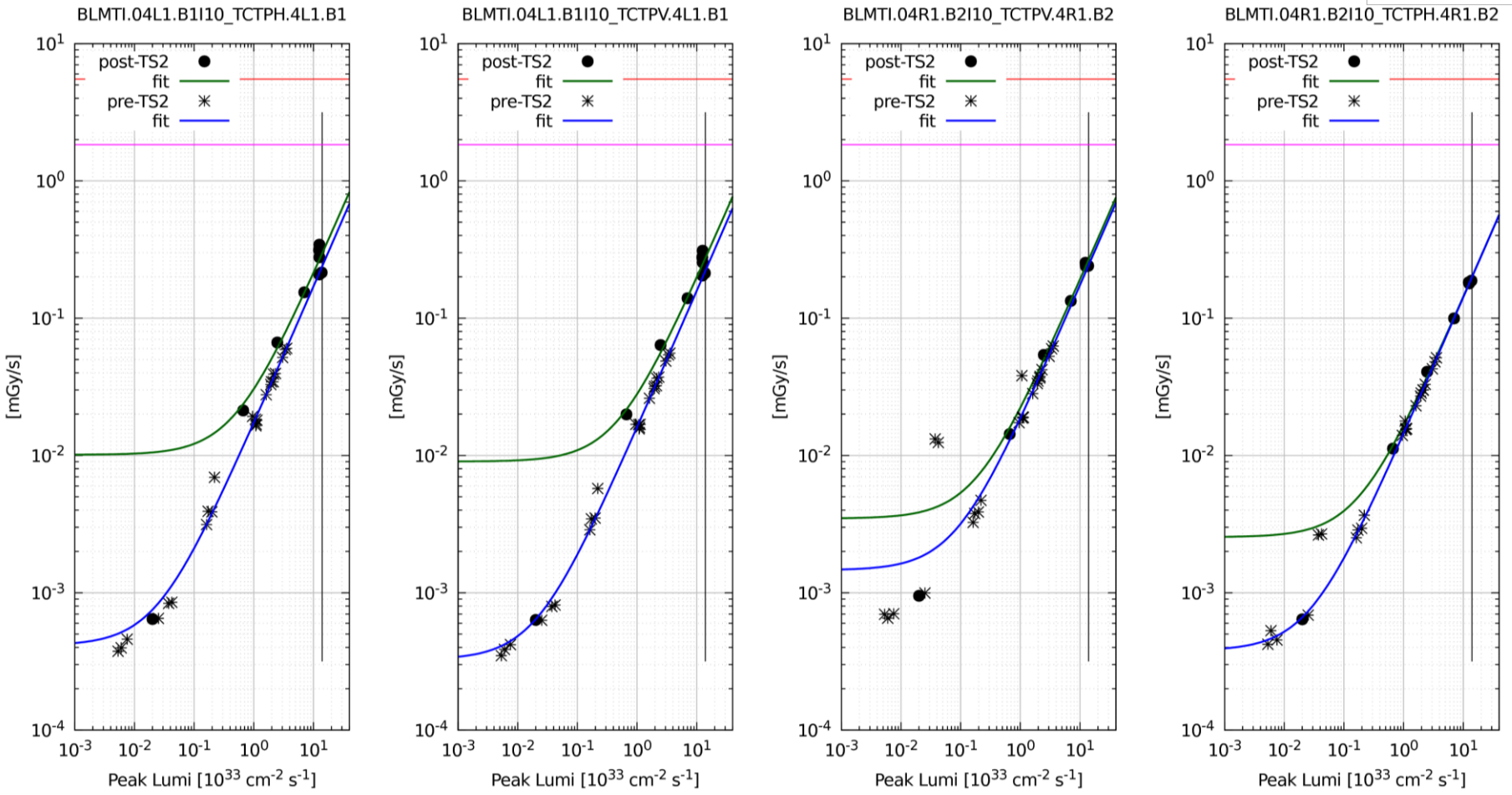
Effect of IP1/5 Crossing Angle Change on BLM Response at TCLs and TCTs

A. Mereghetti, on behalf of the LHC Collimation Team

Change of Crossing Angle in IP1/5

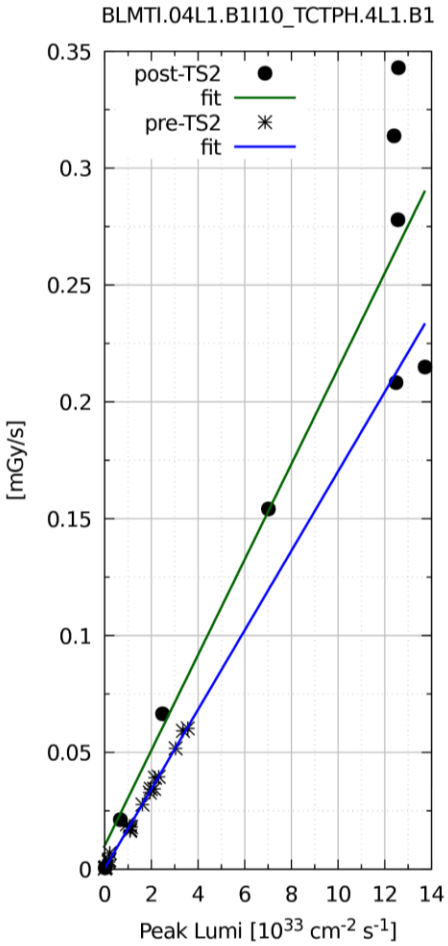
- BLM signals at TCTs / TCLs affected by debris:
  - Once in collisions;
  - Especially on longest RSs;
- A change in crossing conditions implies a re-distribution of debris particles hitting accelerator components; in particular, if crossing angle is reduced, naively one would expect:
  - Less debris intercepted by the IT;
  - More debris intercepted in MS/DS;
- Let's anyway check measurements!
- Results presented here are based on RS12, the one most affected by debris;
- It will be shown that there is no need to change BLM thresholds;

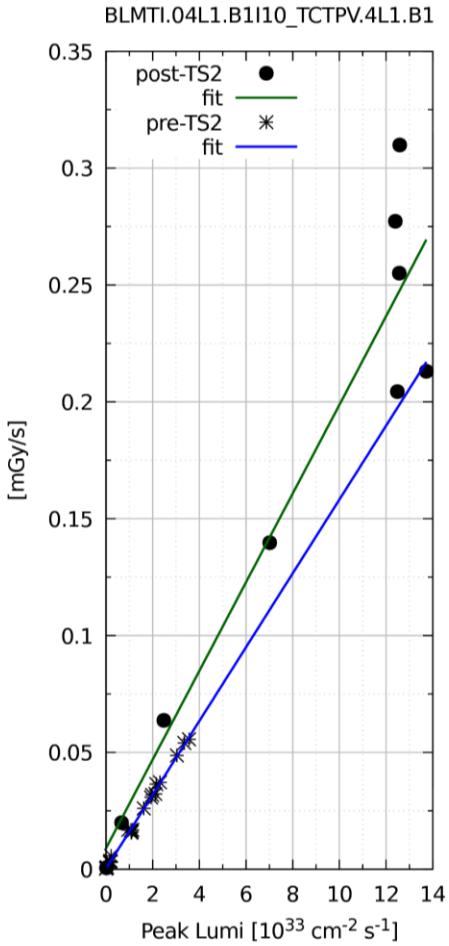
Example: IR1 TCTs

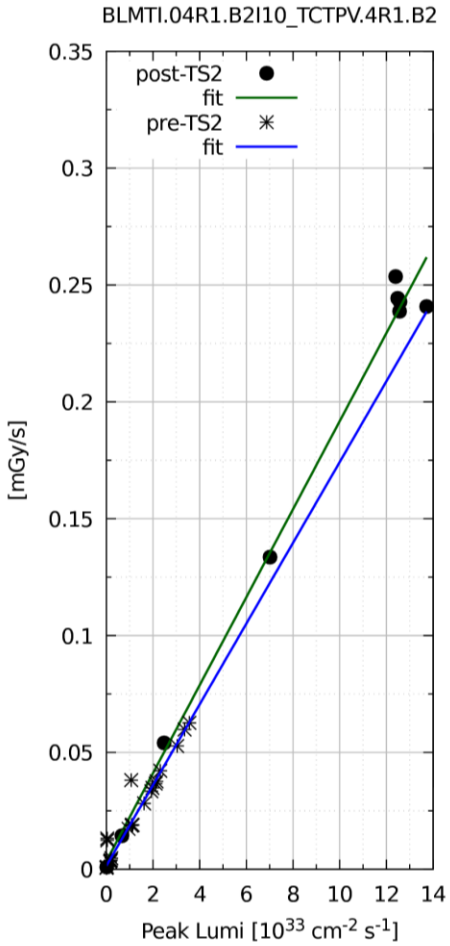


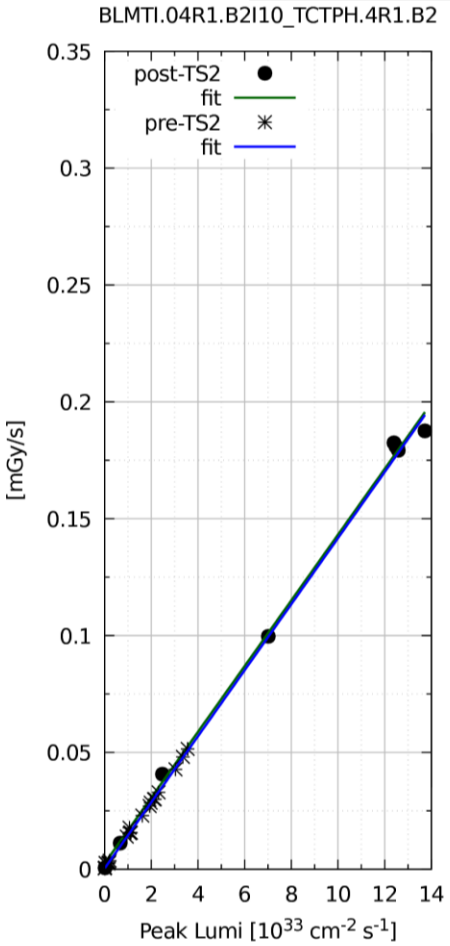
Slightly higher calibration factor wrt pre-TS2…

Example: IR1 TCTs (II)



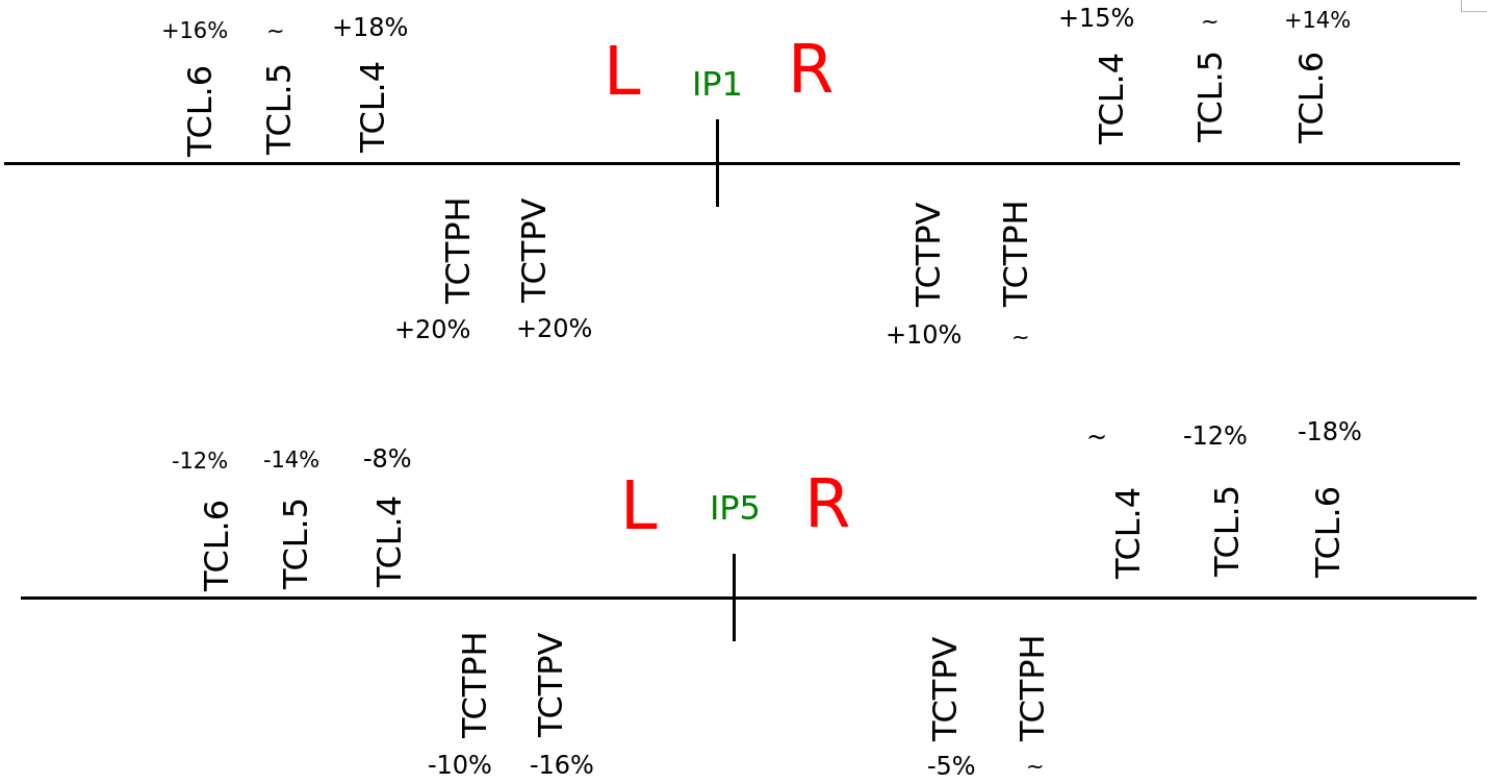






Slightly higher calibration factor wrt pre-TS2…

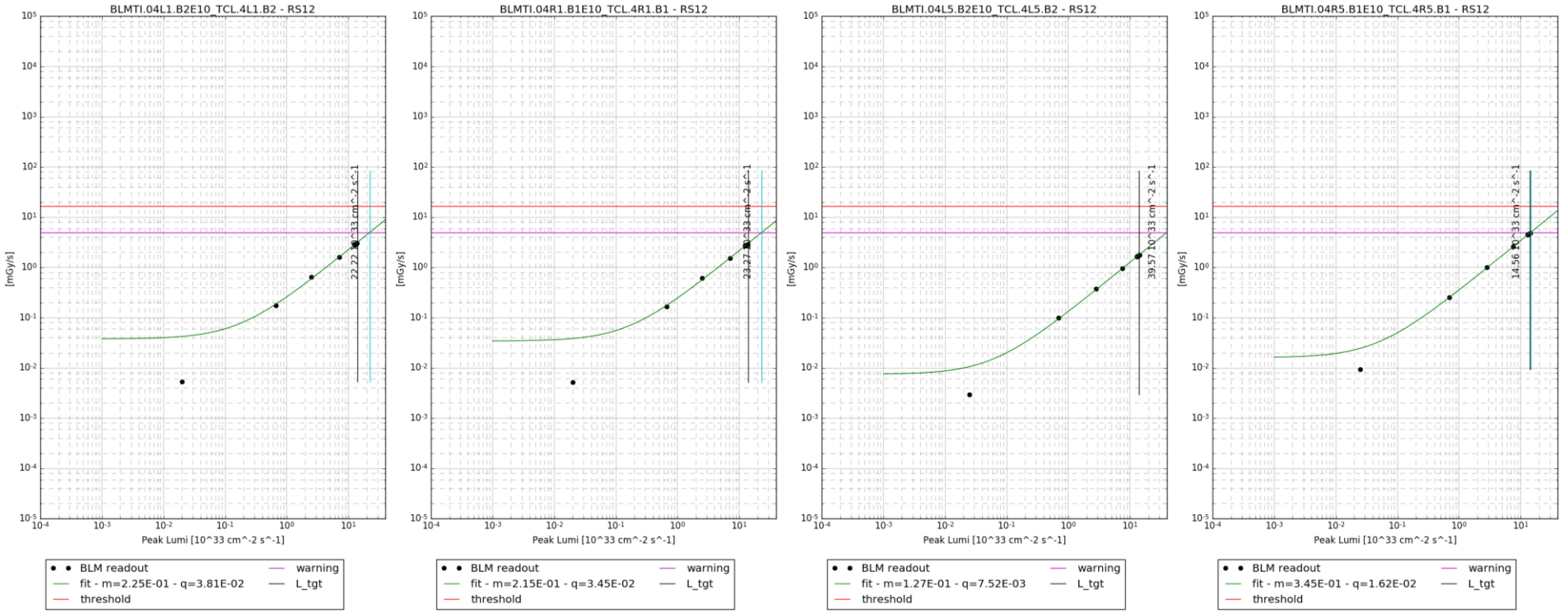
Summary: IR1&IR5



Details are not always intuitive:

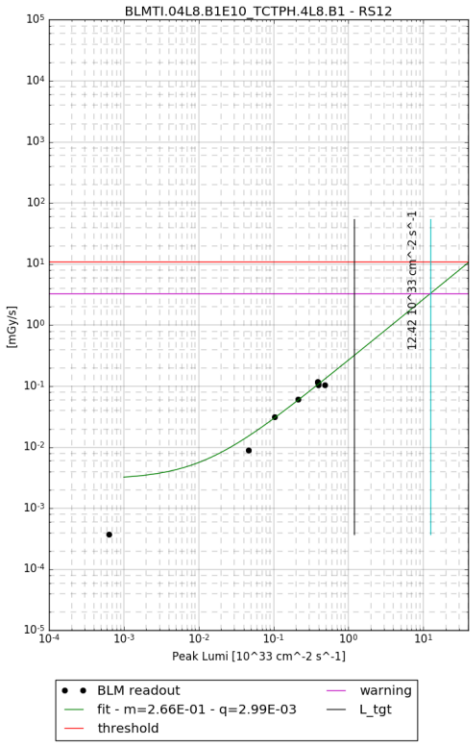
- Real machine conditions have large impact on signals from debris;
- No sensitivity analysis on BLM signals made with simulations which goes that far from the IP;
- Nevertheless: changes not worring;

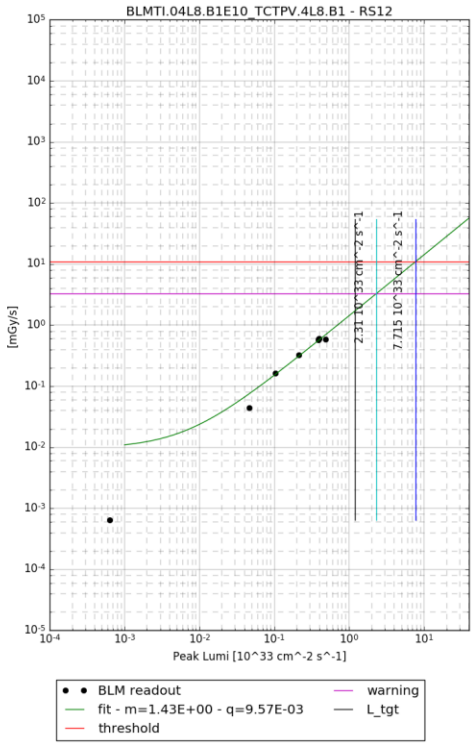
Example: TCL4s

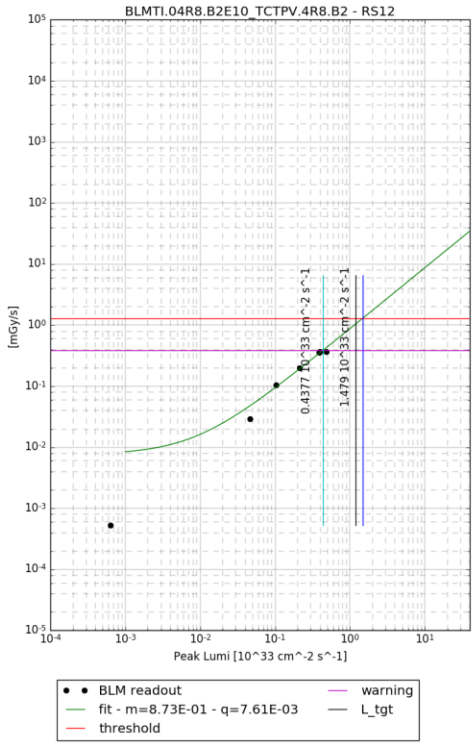


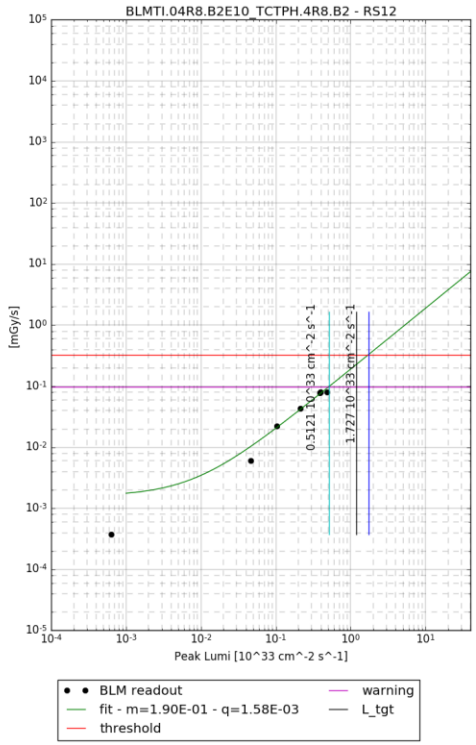
BLM signals at TCL.4R5 just below warning level!

Example: IR8 TCTs

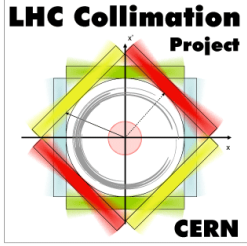








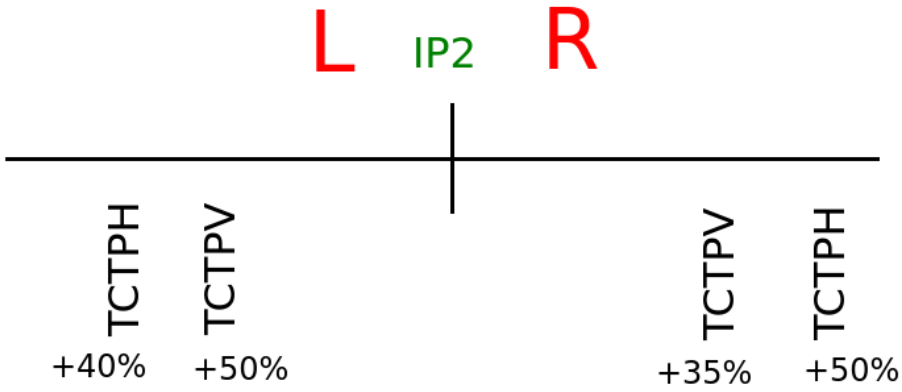
BLM signals at TCTPV.4R8 just below warning level!



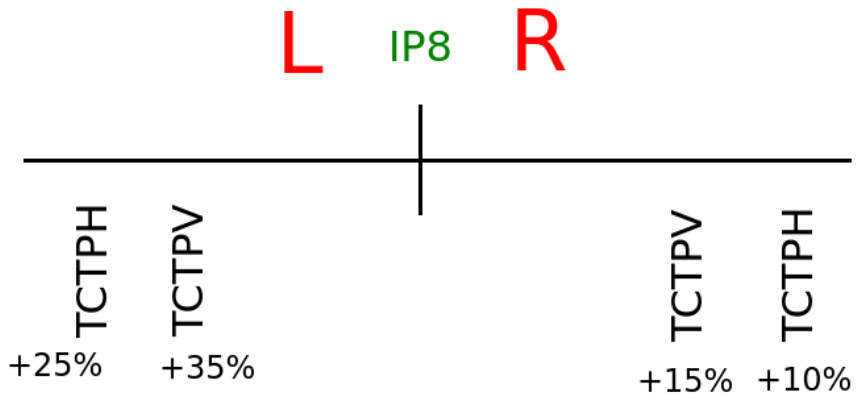
Reserve Slides

Summary: IR2&IR8

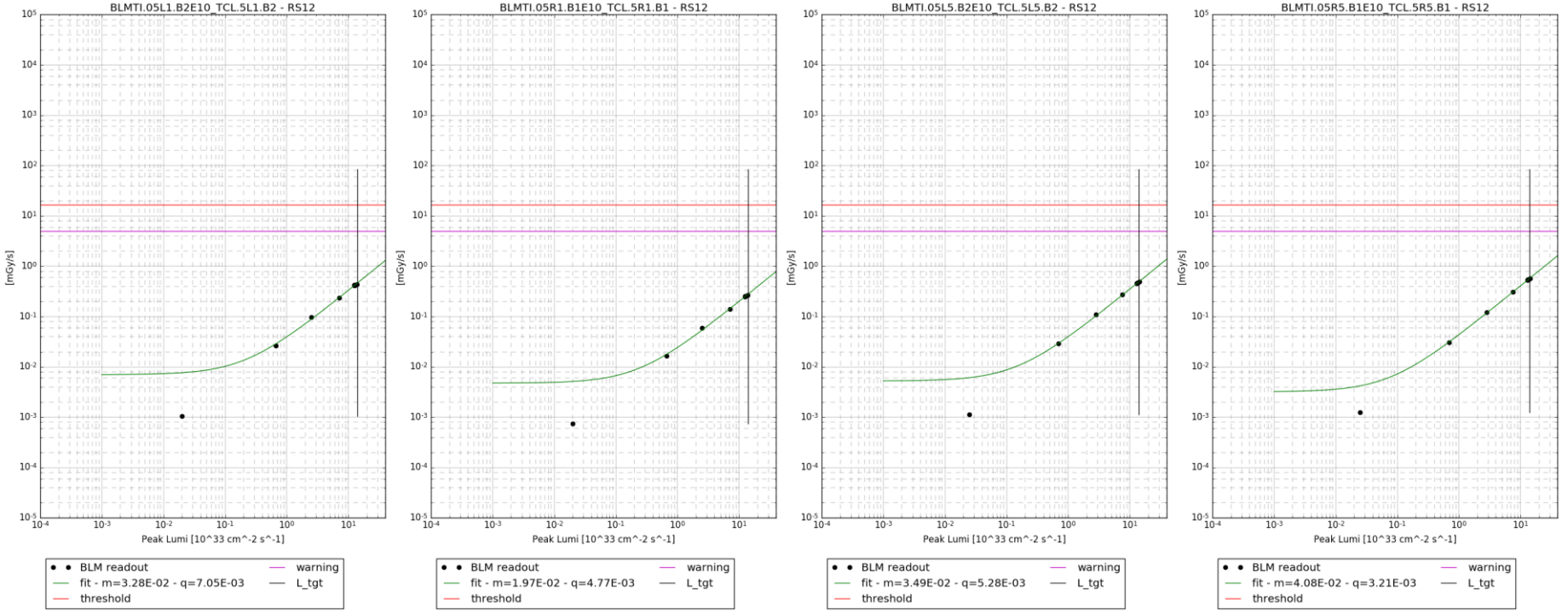
Lumi in IR2 quite low → noisy BLM signals, with large fluctuations…
Nevertheless, clear increase of calibration factor!



Clear increase of calibration factor → in line with change of polarity…



Example: TCL5s



Example: TCL6s (XRPs IN)