BLM Thresholds for Ion-Run BFPP Scenario

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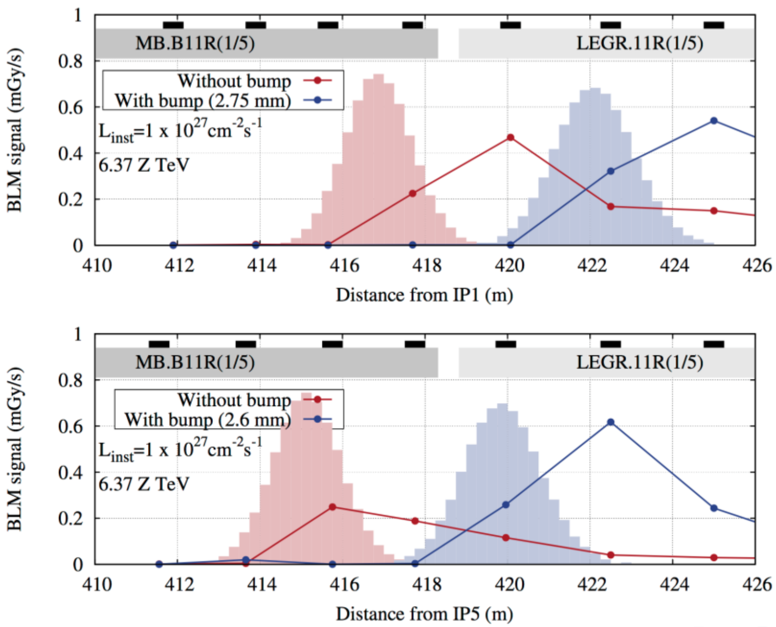
FLUKA Simulations

FLUKA simulations by A. Lechner presented in

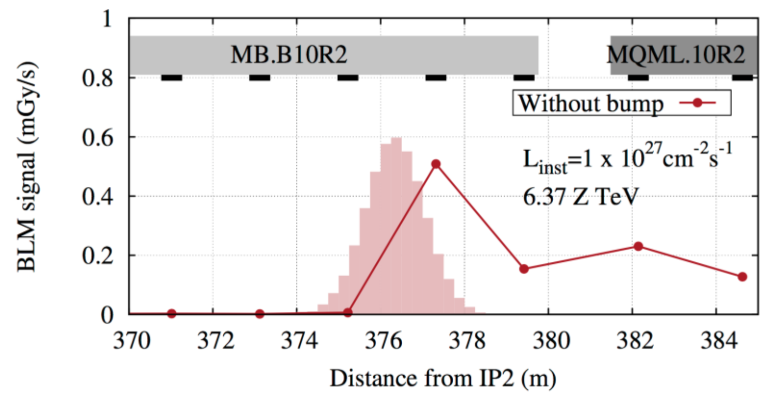
http://indico.cern.ch/e/blmtwg23 and http://indico.cern.ch/e/blmtwg19.

Red … loss distribution without orbit bump.

Blue ... loss distribution with orbit bump.



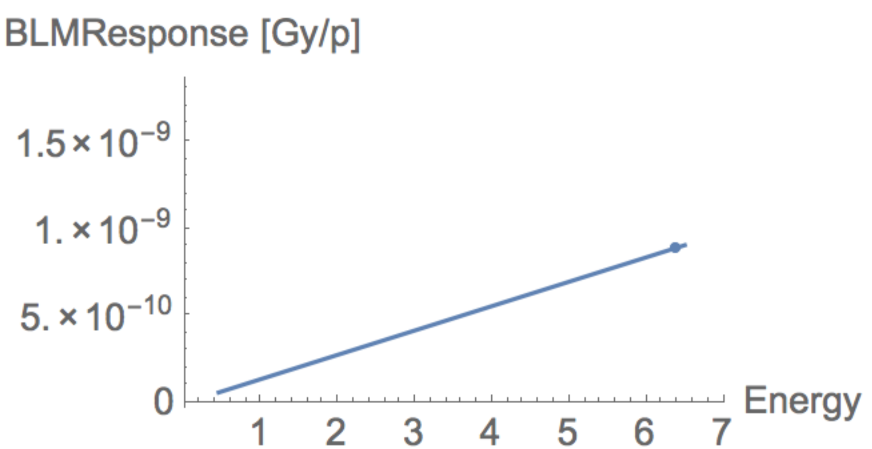
IR 1/5

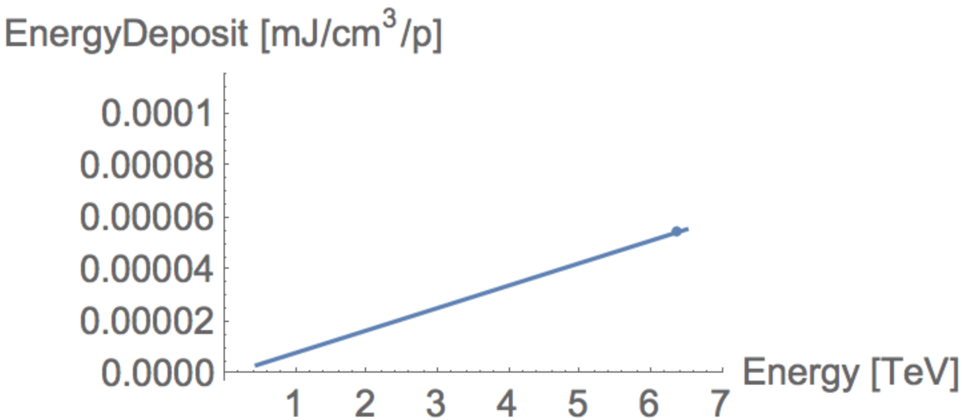


IR 2

BLMResponse and EnergyDeposit

- FLUKA simulations at 6.37 Z TeV.
- The BFPP loss scenario is valid only at ion-run flattop energy.
- Simplistic linear extrapolation, keeping the BLMResponse/EnergyDeposit ratio constant.
- Quench levels re-computed for constant radial shape.
- Same AdHoc Corrections as for other 1.9-K cold-magnet thresholds.



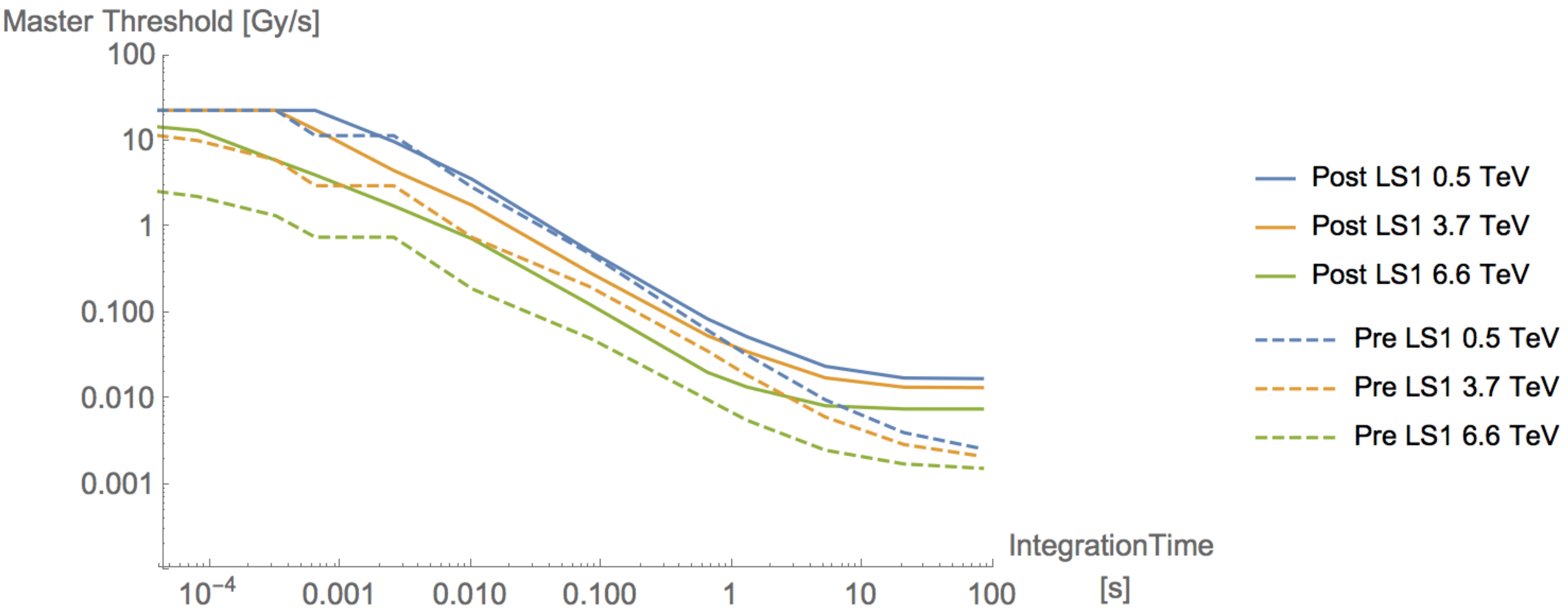


$$\text{BLMSignal@Quench}(E,t) = \frac{\text{BLMResponse}(E,t) * \text{QuenchLevel}(E,t)}{\text{EnergyDeposit}(E,t)}$$

$$\text{MasterThreshold}(E,t) = \ 3 \ \ \text{BLMSignal@Quench}(E,t) * \text{AdHoc}(E,t)$$

Master and Applied Thresholds IR1/5

In order to provide **room for quench tests**, the master thresholds are **scaled x2**.

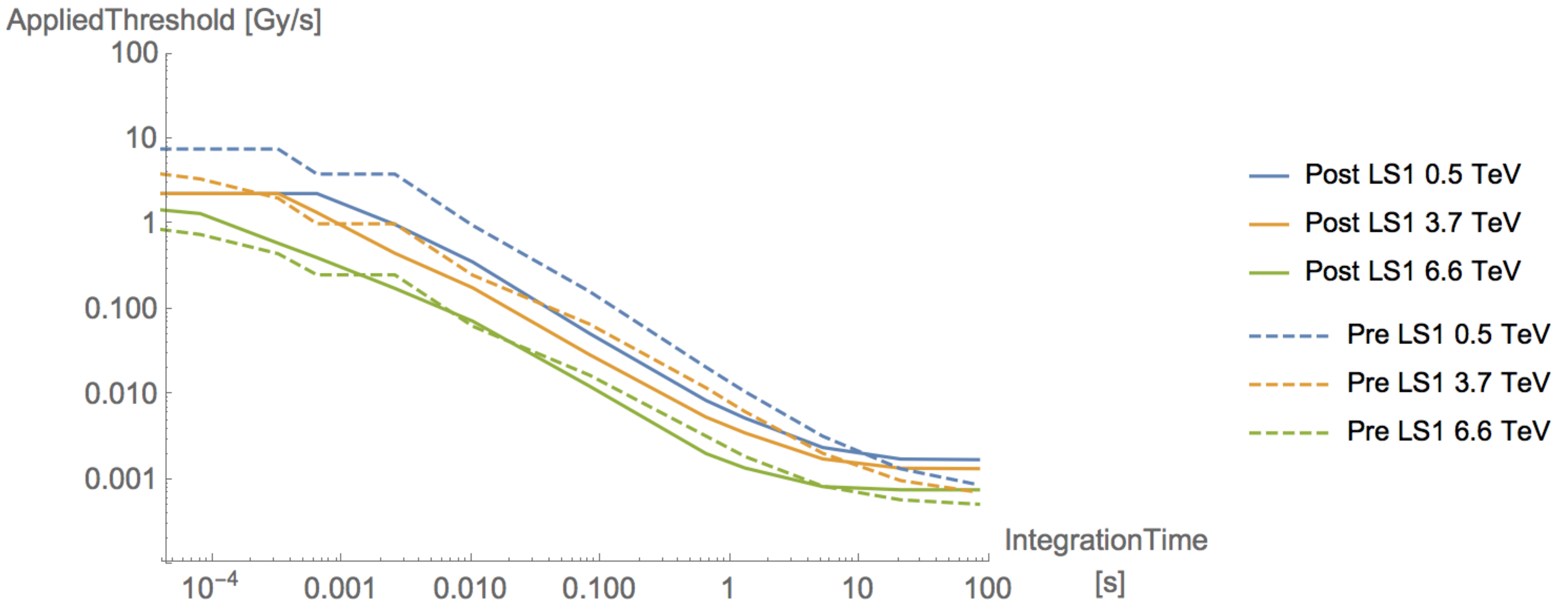


Master and Applied Thresholds IR1/5

In order to provide **room for quench tests**, the master thresholds are **scaled x2**.

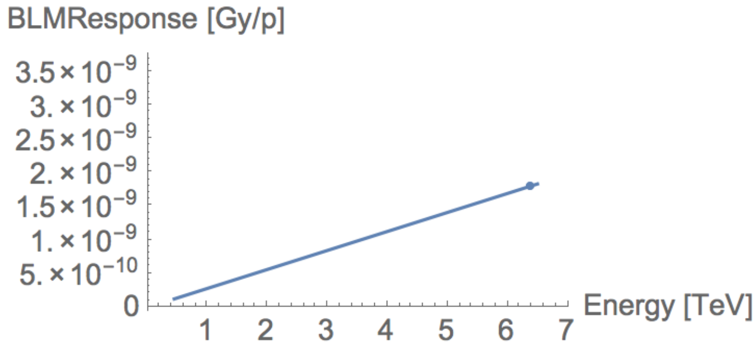
For the **default monitor factor** we propose **0.1** (provides small safety margin wrt. BLMSignal@Quench, i.e., wrt. MonitorFactor 0.166).

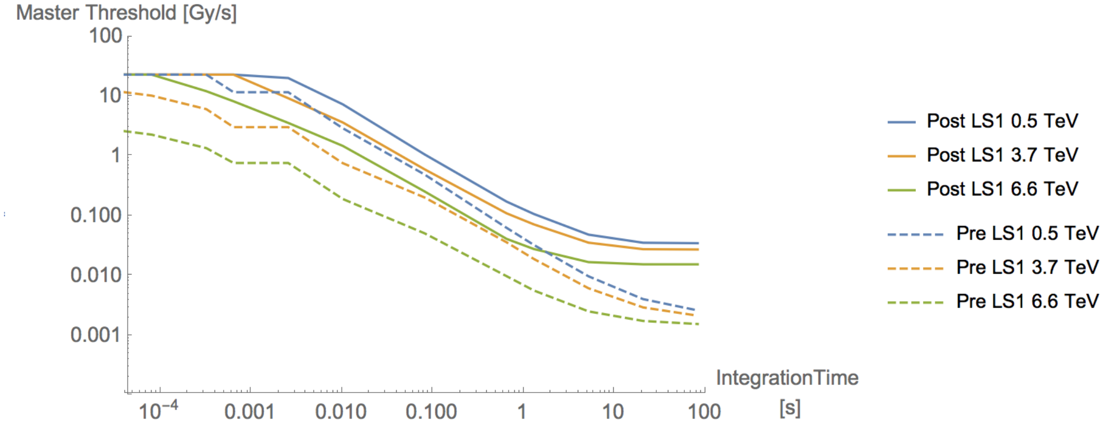
For the old MonitorFactor we used 0.333.

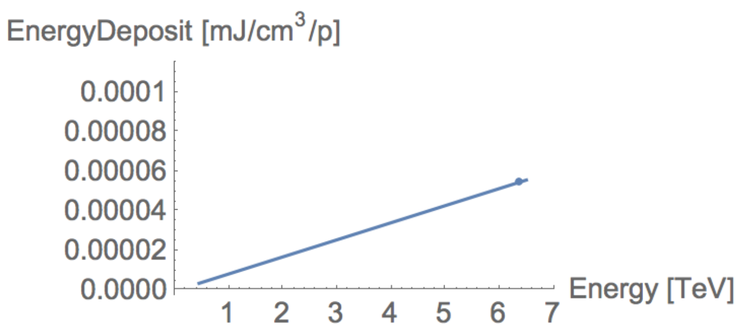


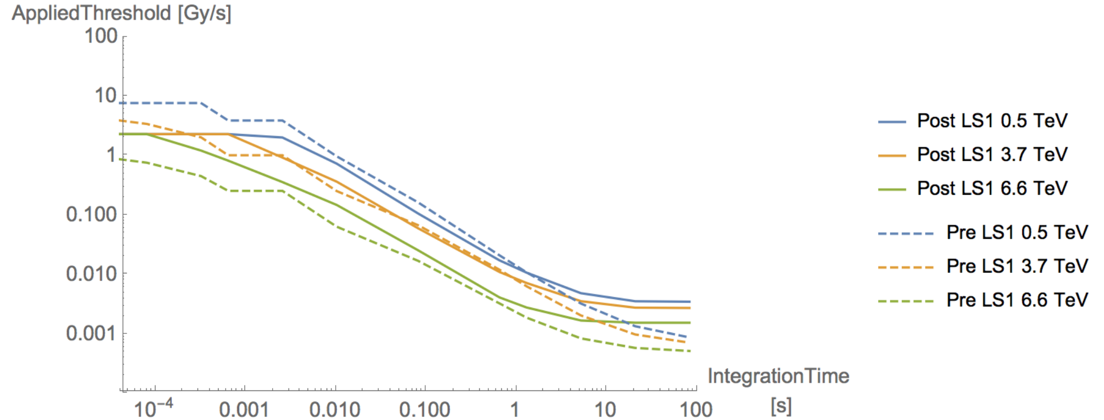
IR 2 Results

FLUKA predicts 2x higher BLMResponse in IR 2, so thresholds are 2x higher in IR 2 than in IR 1/5









Conclusion

- New thresholds are as high or higher as the old ones → should not interfere with proton runs.
- MonitorFactor Strategy allows for thresholds 6x higher than conservative estimate of BLMSignal@Quench during quench test.
- ECR is almost finalized.
- John Jowett will present the new thresholds in his presentation to LMC on Nov. 6.

THRI.IP15.DS.MB_ION_MF

- BLMEI.11L1.B2E24_MBA -417.9032m
- BLMEI.11L1.B2E23_MBA -415.8832m
- BLMEI.11L1.B2E22_MBA -413.9032m
- BLMEI.11L1.B2E21_MBA -409.4032m
- BLMEI.11R1.B1E21_MBB 411.9000m
- BLMEI.11R1.B1E22_MBB 413.9000m
- BLMEI.11R1.B1E23_MBB 415.6500m
- BLMEI.11R1.B1E24_MBB 417.7000m
- BLMEI.11L5.B2E24_MBA -417.9416m
- BLMEI.11L5.B2E23_MBA -416.2416m
- BLMEI.11L5.B2E22_MBA -414.1416m
- BLMEI.11L5.B2E21_MBA -412.0416m
- BLMEI.11R5.B1E21_MBB 411.5584m
- BLMEI.11R5.B1E22_MBB 413.6584m
- BLMEI.11R5.B1E23_MBB 415.7584m
- BLMEI.11R5.B1E24_MBB 417.7584m

THRI.IP2.DS.MB_ION_MF

- BLMEI.10L2.B2I27_MBA -379.2804m
- BLMEI.10L2.B2I26_MBA -377.2804m
- BLMEI.10L2.B2I25_MBA -375.3304m
- BLMEI.10L2.B2I24_MBA -373.2304m
- BLMEI.10L2.B2I23_MBA -371.1804m
- BLMEI.10L2.B2I22_MBA -369.0804m
- BLMEI.10L2.B2I21_MBA -366.5304m
- BLMEI.10R2.B1I21_MBB 368.9196m
- BLMEI.10R2.B1I22_MBB 371.0196m
- BLMEI.10R2.B1I23_MBB 373.1196m
- BLMEI.10R2.B1I24_MBB 375.2196m
- BLMEI.10R2.B1I25_MBB 377.3196m
- BLMEI.10R2.B1I26_MBB 379.4196m