

Temperature increase in Roman Pot window

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- A. Lechner presented FLUKA results [1] for direct beam impact on the jaw of XRPB.B6L5. One case studied was a small impact parameter (0.85σ) where the beam hits directly the stainless steel window at the jaw edge; for this scenario, the simulation predicted a temperature increase in the window of less than 250 K.
- M. Deile pointed out that in a previous FLUKA-based study [2] a significantly higher temperature increase in the foil was found (over 2000 K).
- **MPP action request:** Mario and Anton will cross-check the input parameters (number of impacting bunches, impact parameters, beam sizes, ...) and compare the results of the current simulation with previous estimates for beam impacts on the XRPBs.

Comparison of parameters

- The table below summarizes the key parameters assumed in both studies

	[1]	[2]
Momentum	4 TeV/c	7 TeV/c
Nmb. of bunches	1	1
σ_x	88 μm	80 μm
σ_y	384 μm	30 μm
Foil thickness	150 μm	200 μm
Foil length (in beam dir.)	5 cm	3.4 cm
Foil orientation	vertical	horizontal
Impact parameter	foil center	foil center

References

[1] A. Lechner, V. Boccone and F. Cerutti (on behalf of the FLUKA team), "FLUKA simulations of accidental beam impact on TOTEM Roman Pots: new results (and corrigendum to previous results)", Presentation at LHC MPP 22/06/2012.

[2] E. Dimovasili and D. Macina, "Energy Deposition in the Window of the TOTEM Roman Pot for the nominal TOTEM run", TS-Note-2005-051, EDMS Nr 604248.

Conclusion

- The differences in the calculated temperature increase can primarily be attributed to the significantly smaller beam size assumed in [2].