

Update on loss maps for input to energy deposition studies

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Loss maps studies for **different layout configurations, TCPs length and planes:**

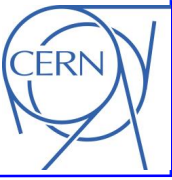
- *With and without TCLDs*
- Active length of *TCPs either of 60 cm or 30 cm of CFC*
- *Horizontal and vertical planes*

Initial input for the SixTrack-FLUKA coupling provided by M. Fiascaris:

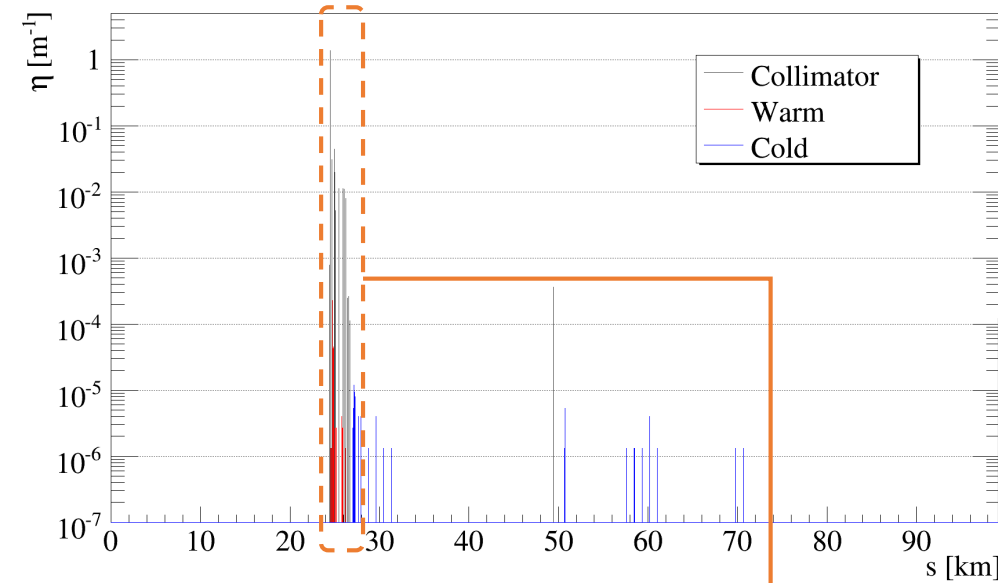
- *Lattice V.14* (only betatron insertion plus local triplet protection)
- *DPM jet* used in FLUKA

Collimator settings:

Family	Settings [σ]
TCP	7.57
TCS	8.83
TCLA	12.61
TCLD	24.00
TCT	10.47

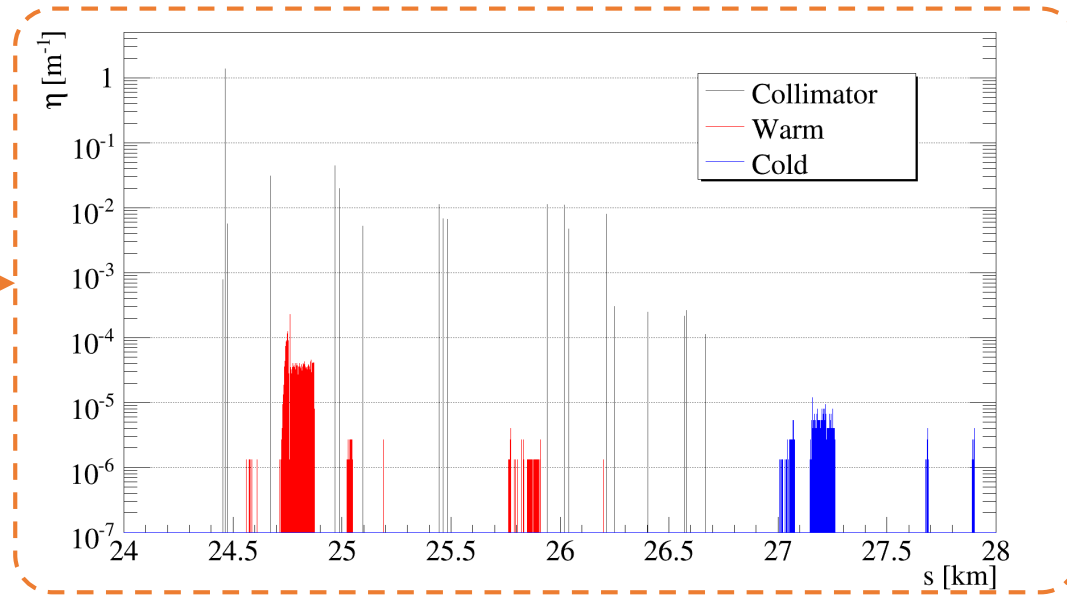


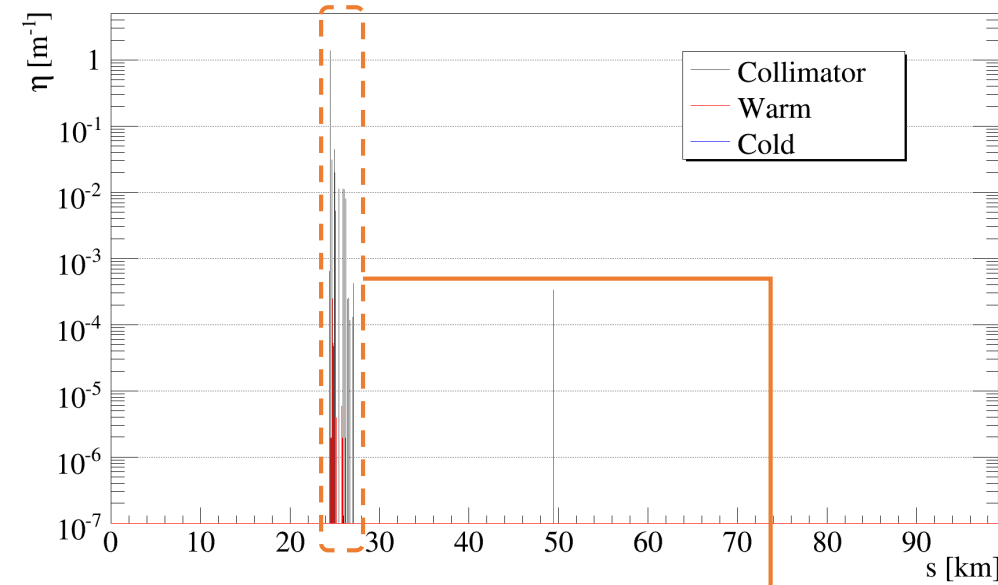
Horizontal halo



Complete loss map

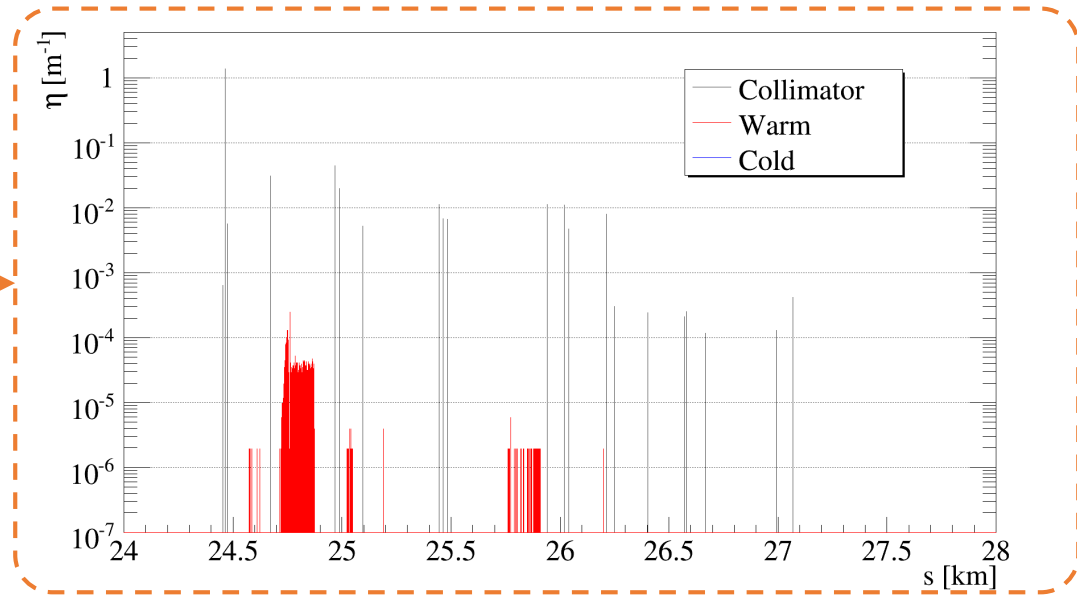
Betatron cleaning insertion



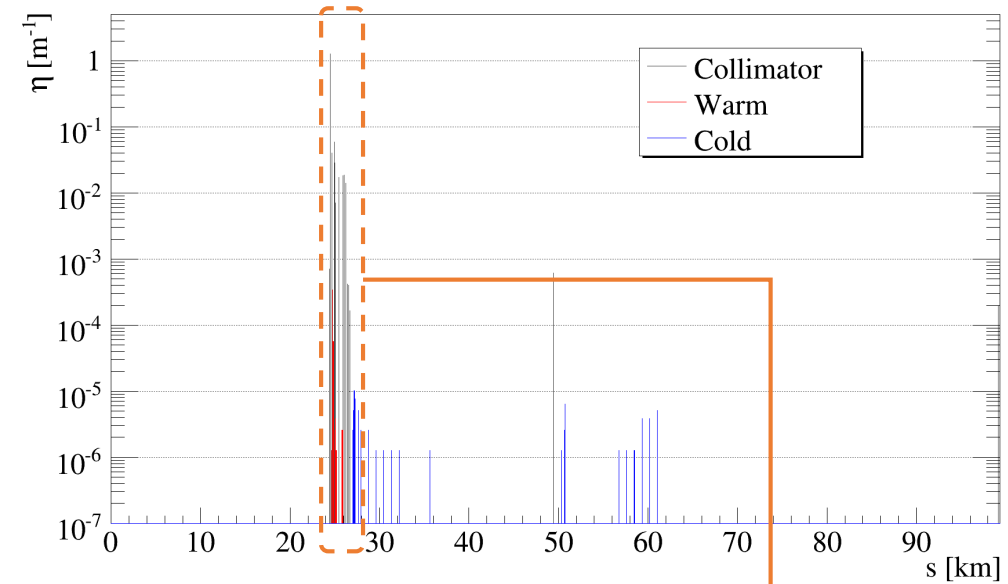


Complete loss map

Betatron cleaning insertion

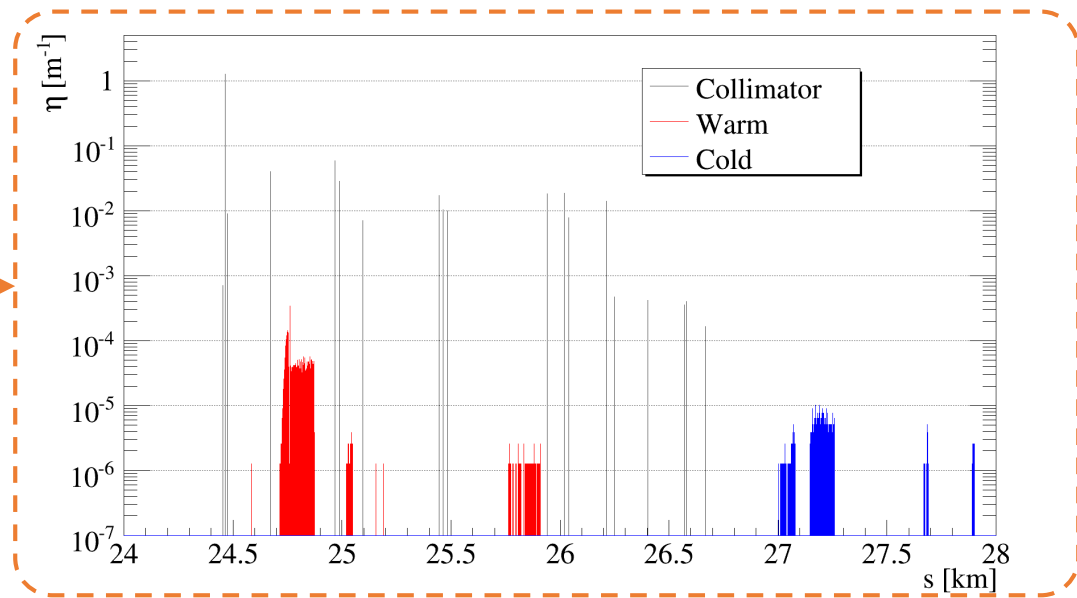


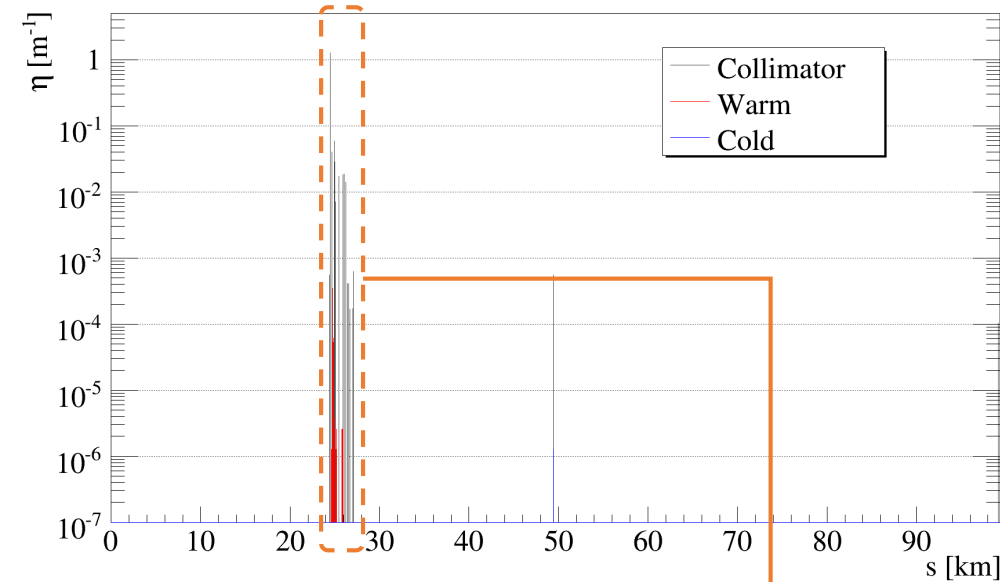
Horizontal – no TCLD – TCP 30 cm



Complete loss map

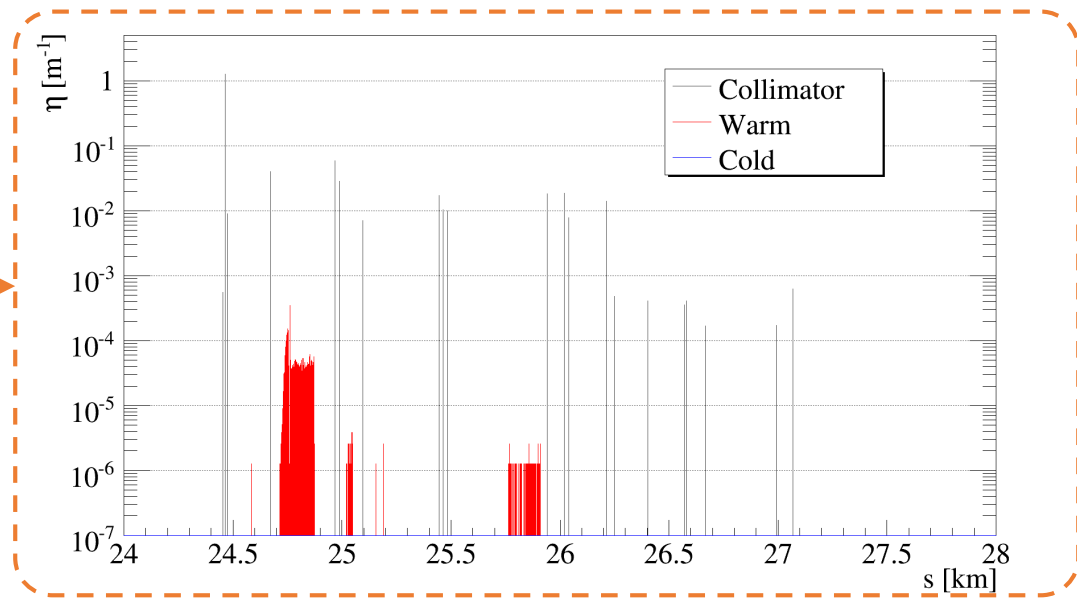
Betatron cleaning insertion





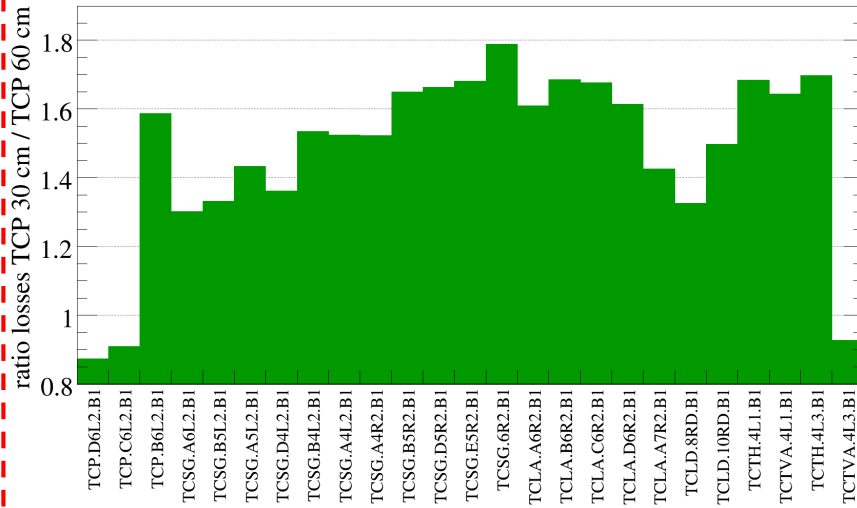
Complete loss map

Betatron cleaning insertion

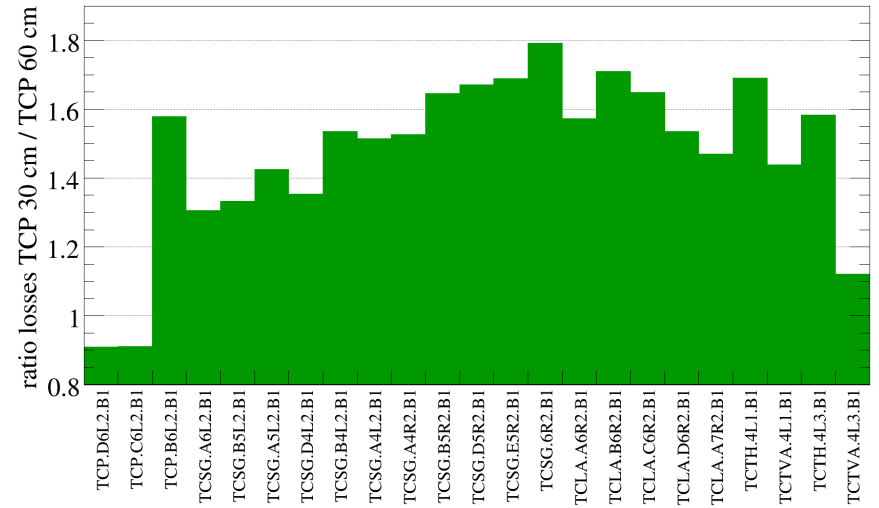


Ratio of losses on collimators using TCPs of 30 cm / 60 cm:

With TCLDs



Without TCLDs



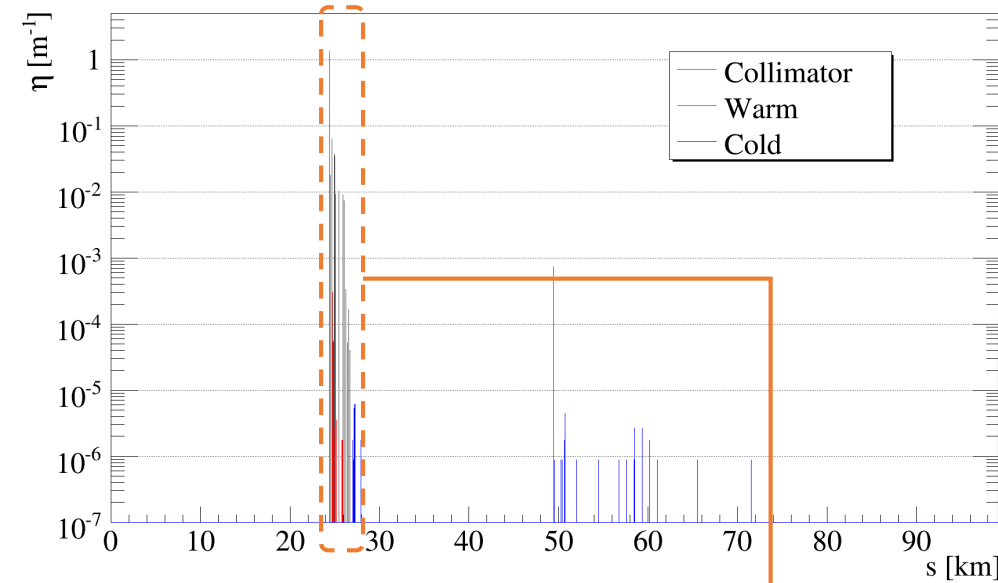
Losses in the DS cluster without TCLDs for TCPs of different length:

Case	Inefficiency [m ⁻¹]
TCPs of 30 cm	$(3.70 \pm 0.03) \times 10^{-6}$
TCPs of 60 cm	$(3.60 \pm 0.04) \times 10^{-6}$



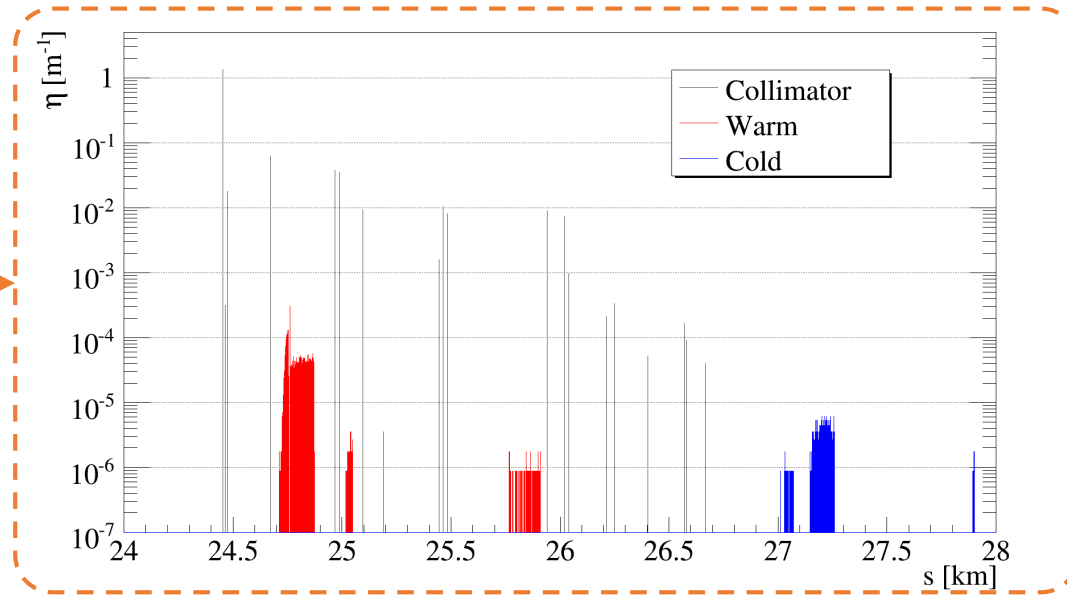
Vertical halo

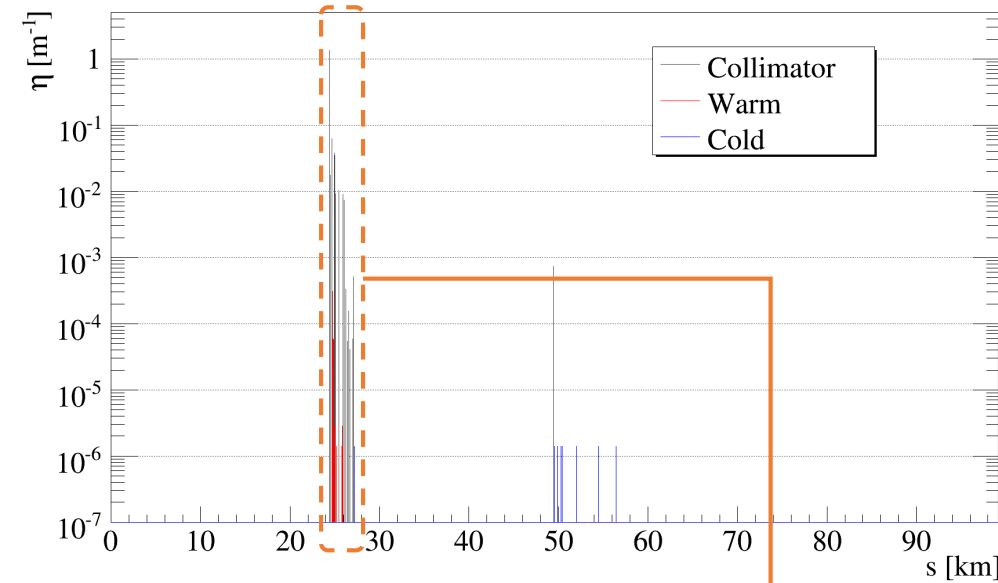
Vertical – no TCLD



Complete loss map

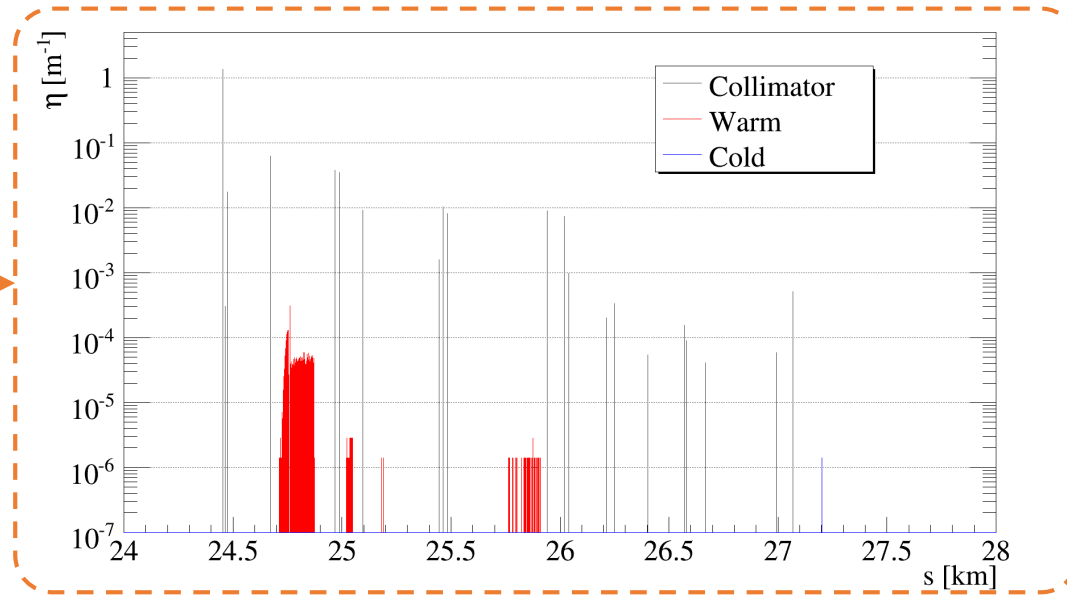
Betatron cleaning insertion

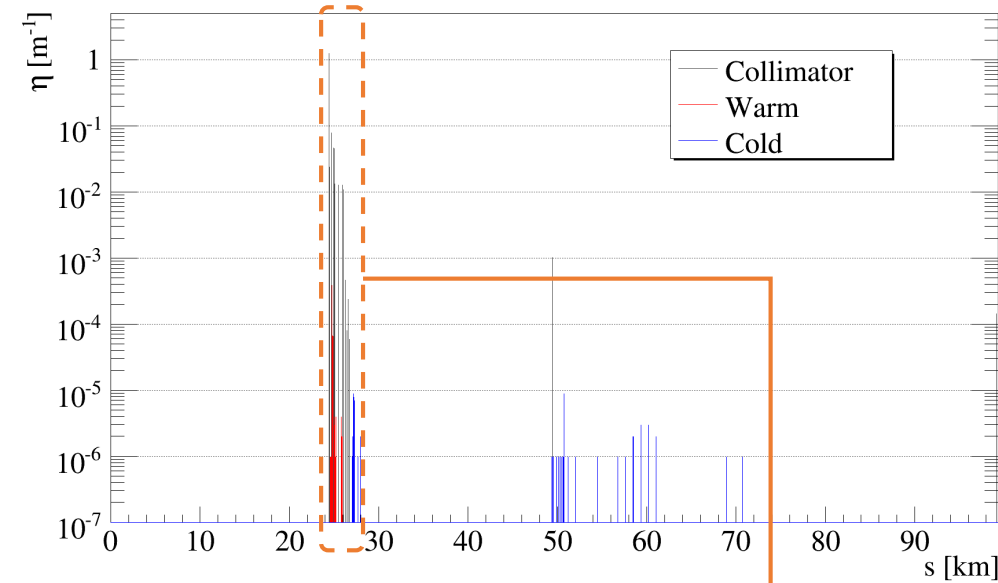




Complete loss map

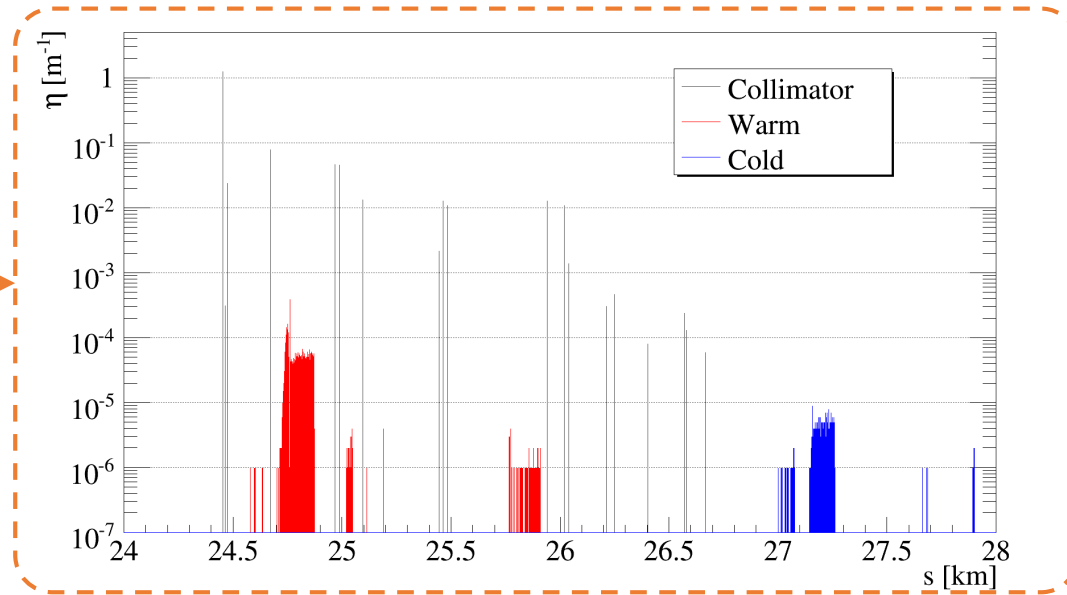
Betatron cleaning insertion

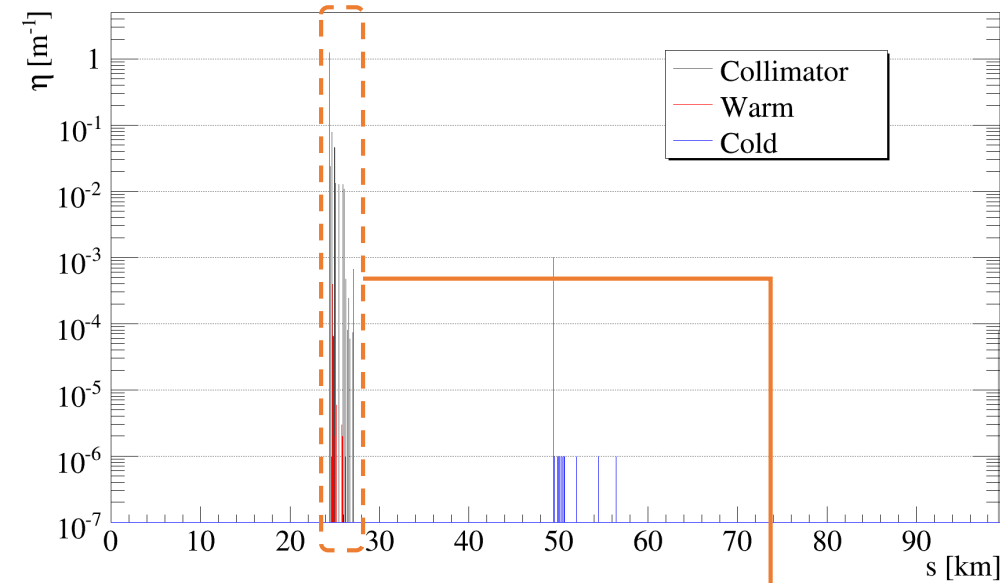




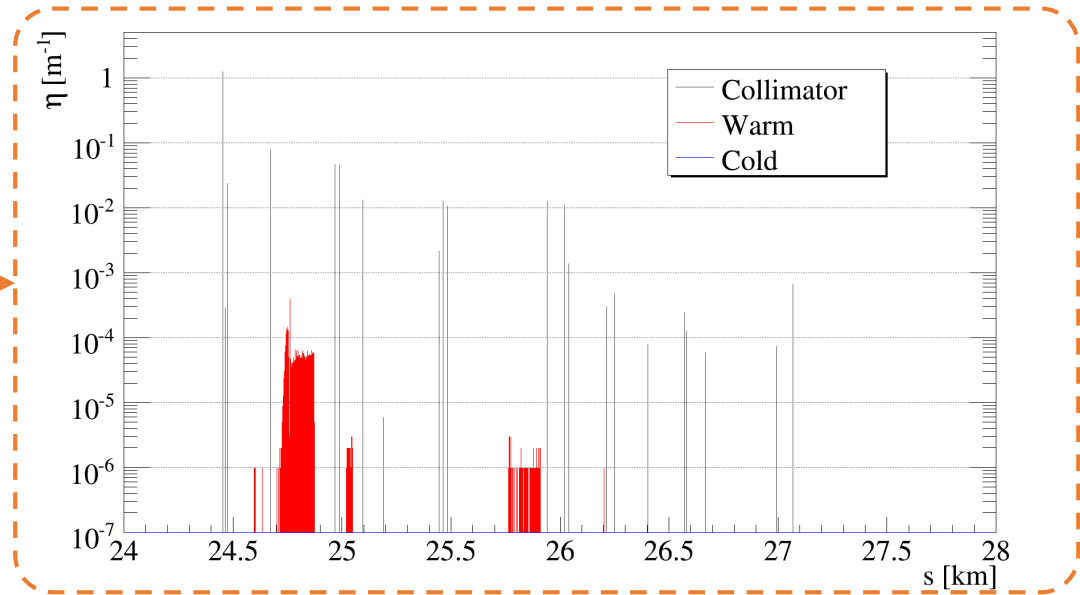
Complete loss map

Betatron cleaning insertion



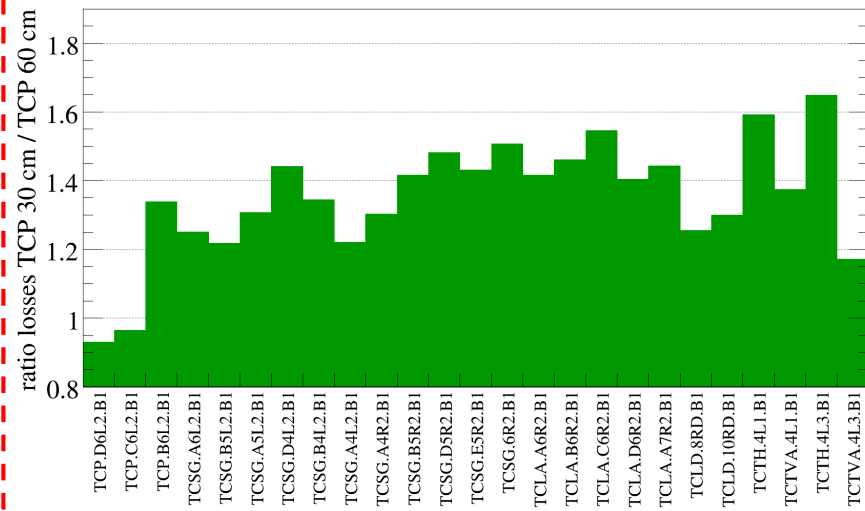


*Betatron cleaning
insertion*

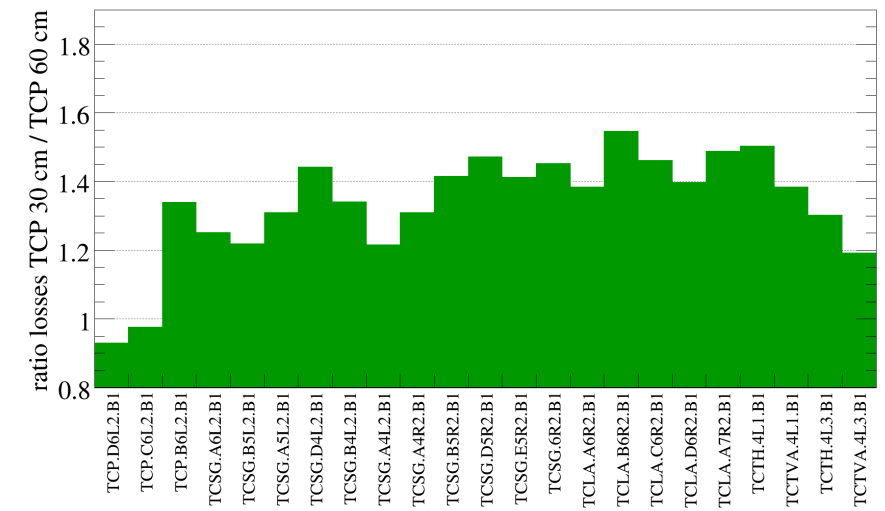


Ratio of losses on collimators using TCPs of 30 cm / 60 cm:

With TCLDs



Without TCLDs



Losses in the DS cluster without TCLDs for TCPs of different length:

Case	Inefficiency [m ⁻¹]
TCPs of 30 cm	$(2.98 \pm 0.03) \times 10^{-6}$
TCPs of 60 cm	$(2.56 \pm 0.02) \times 10^{-6}$



Conclusions

- ✓ **Loss maps** studies for **different layout configurations, TCPs length and planes**:
 - *With and without TCLDs*
 - Active length of *TCPs either of 60 cm or 30 cm of CFC*
 - *Horizontal and vertical planes*
 - *Lattice V.14* (only betatron insertion plus local triplet protection)
 - *DPM jet* used in FLUKA

- ✓ The **presence of TCLDs** lead to about the **complete suppression of cold losses**

- ✓ **TCP length of 30 cm instead of 60 cm** lead to:
 - *About 10% loss reduction of the H&V TCPs*
 - *Increment of losses in the range of 30-60% on the skew TCP*
(which has however about a factor 100 less than the other TCPs)
 - *Increment of losses in the range of 20-80% on the other collimators*
 - *Cleaning within the 3% (12%) in the case of horizontal (vertical) halo, without TCLDs*