Collimation tracking update.

J. Molson

18 March, 2016
Since last time

- 64m proton betatron horizontal halo finished.
- Initial tracking with momentum collimation insertion.
- More development of post-processing tools.
- No new lattices tracked - still waiting on a final energy collimation optical design.
Betatron collimation

Local cleaning efficiency

Distance from iPA (m)

Collimators Merlin
Warm areas Merlin
Cold areas Merlin
Energy collimation

![Diagram showing energy collimation](image_url)
$7.5 \times 10^{-4}$
$5 \times 10^{-4}$
Physics comparison at FCC energies

- Last time Stefano asked why the DS losses were lower (relative to Sixtrack).
- Cross section differences - the single diffraction cross section is lower in Merlin than in Sixtrack.
- Plan to put the Merlin scattering physics into Sixtrack.
- Still wish to do a collimation code physics comparison (Merlin, Sixtrack, Geant4/BDSIM, FLUKA).
Elastic differential cross sections

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FCC tracking status
Elastic differential cross sections

![Graph showing differential cross sections](image-url)
Elastic differential cross sections

![Graph showing elastic differential cross sections](image)
Elastic differential cross sections
FCC collimation elastic differential cross sections

\[ \frac{d\sigma}{dt} \text{(mb/GeV)} \]

Graph showing differential cross sections as a function of \(|t|\) GeV\(^2\). The graph includes different data points and fits for varying energies and conditions, with chi-square and degrees of freedom values provided for one of the fits.
Integrated cross sections