Preliminary study of MEBT & DTL collimation

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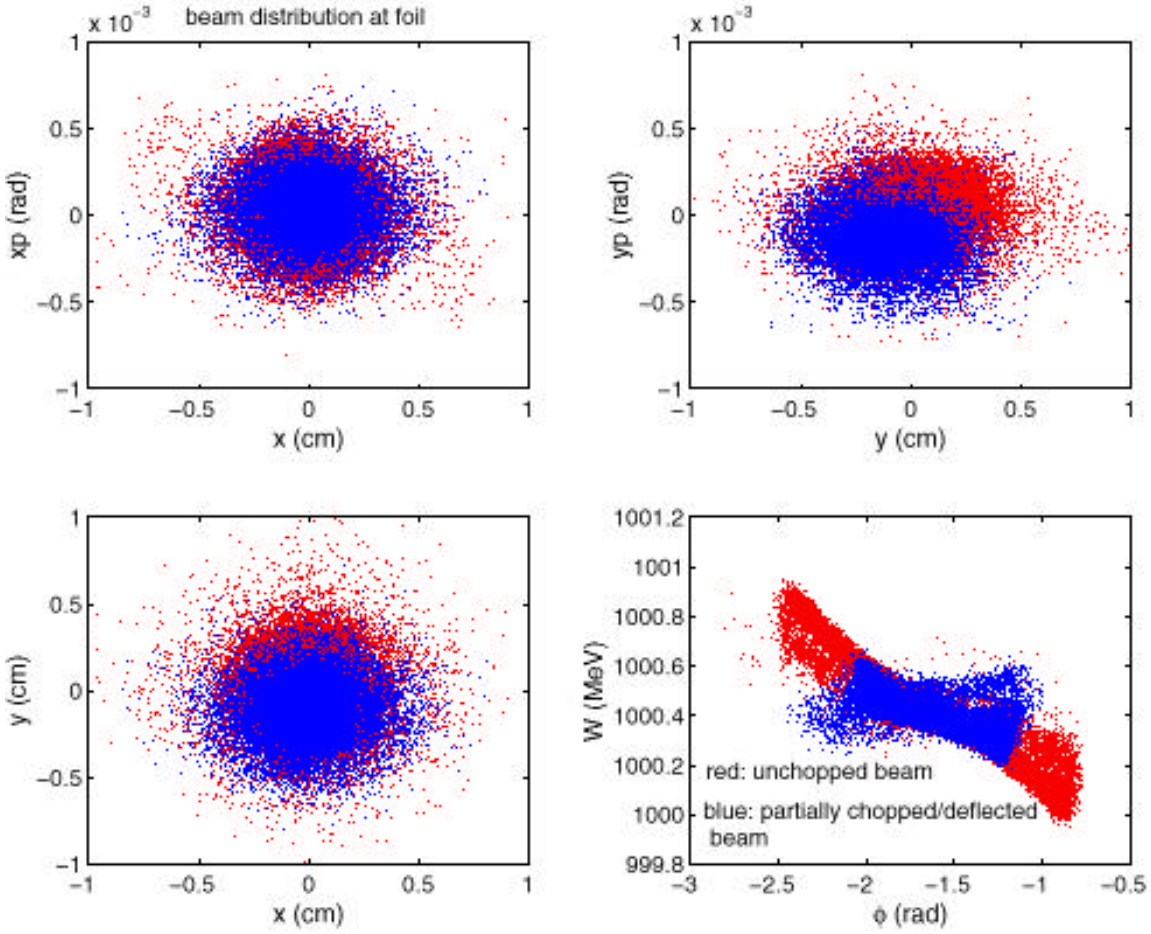
Without anti-chopper

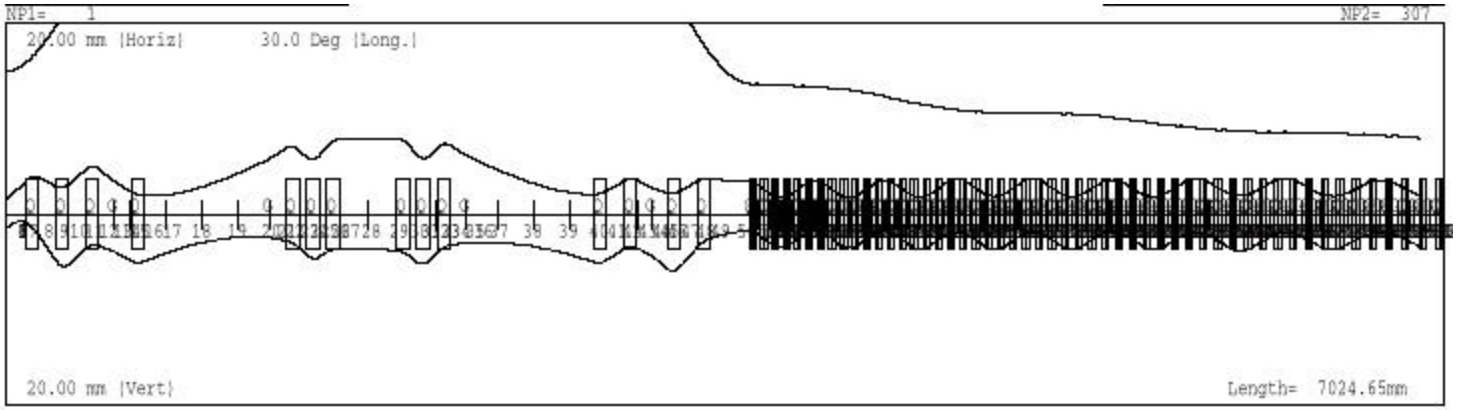
- Partially chopped/deflected beam still arrives at the foil without a beam loss in the linac.
- Anti-chopper box or the adjacent beam box as a potential scraper location



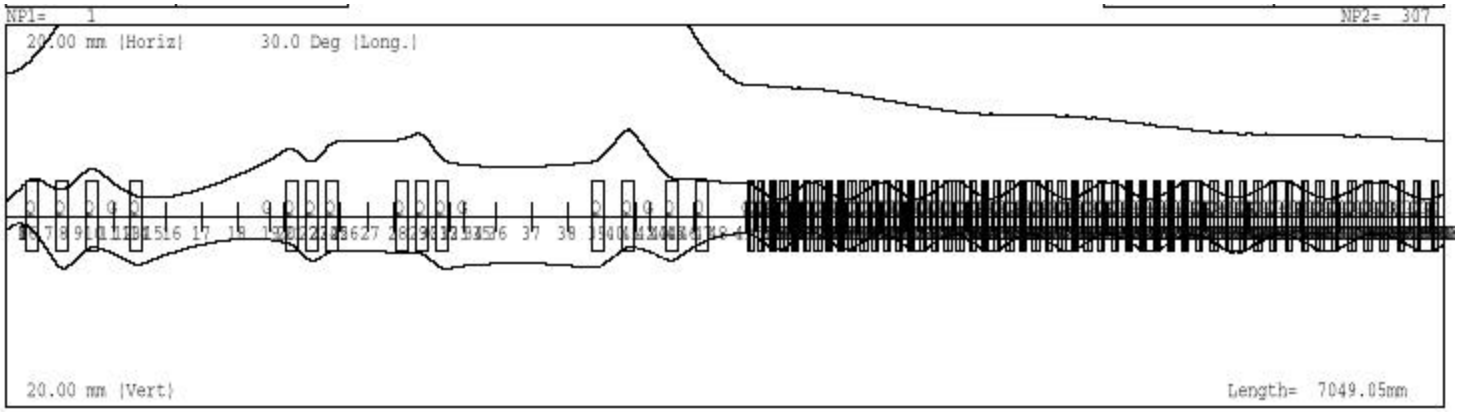
Blue:
75% of beam is scraped by chopper target

Red:
Unchopped beam

MEBT optics is modified to make scraping easier at anti-chopper box



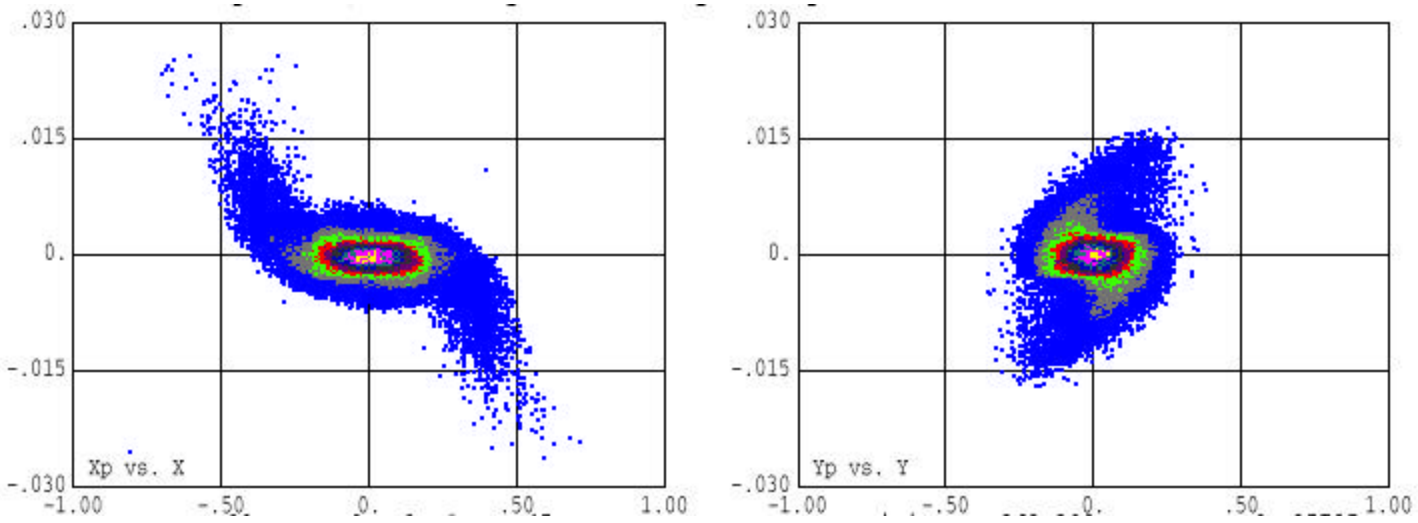
Baseline MEBT optics



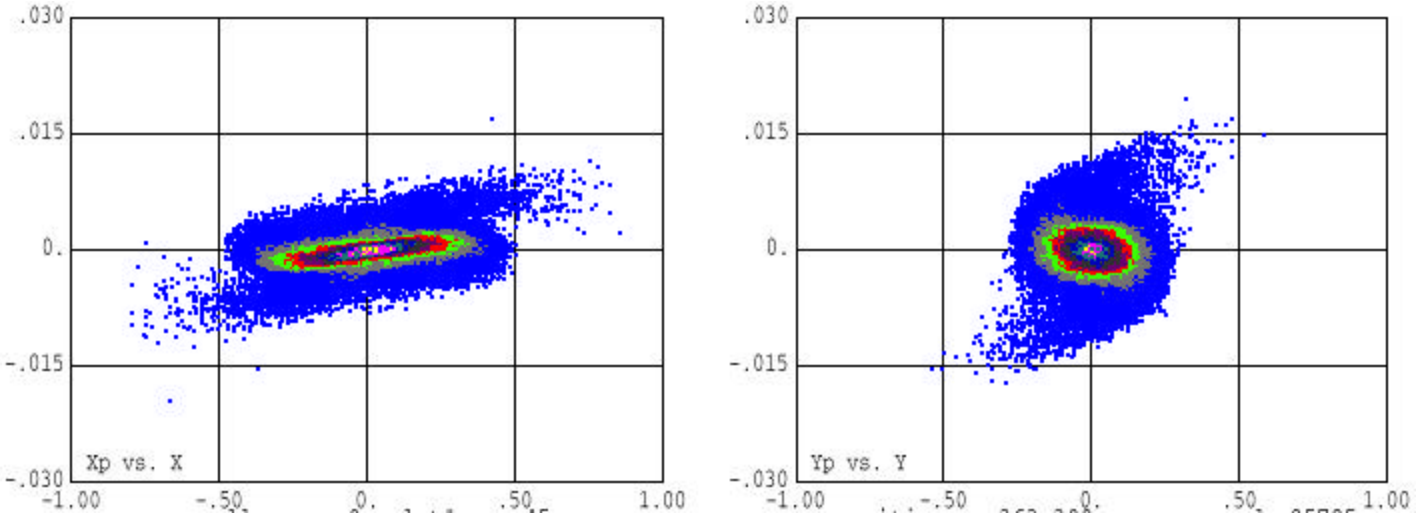
Modified MEBT optics

for scrapers in anti-chopper box

Beam distribution at the entrance to DTL is improved



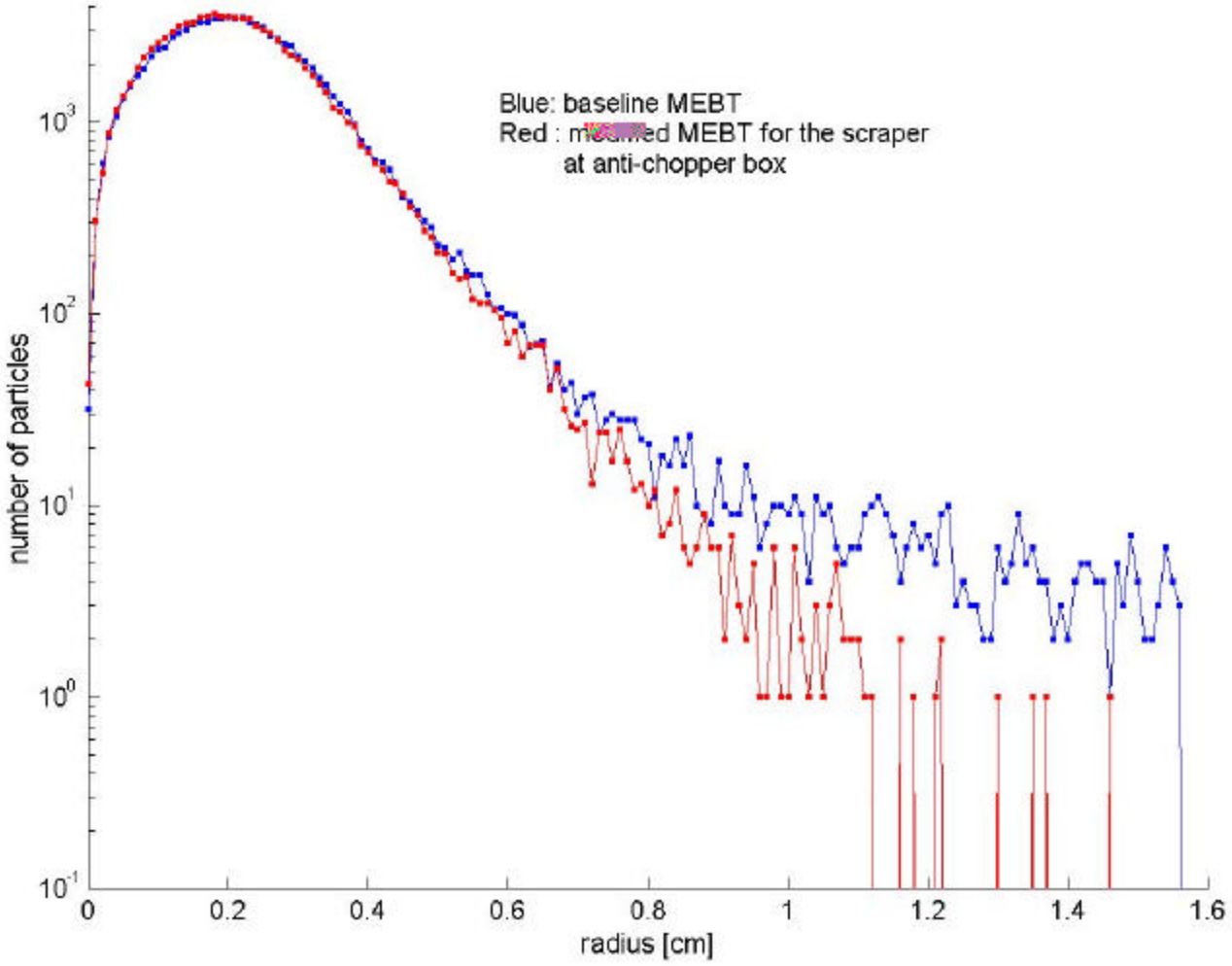
Baseline MEBT



Modified MEBT

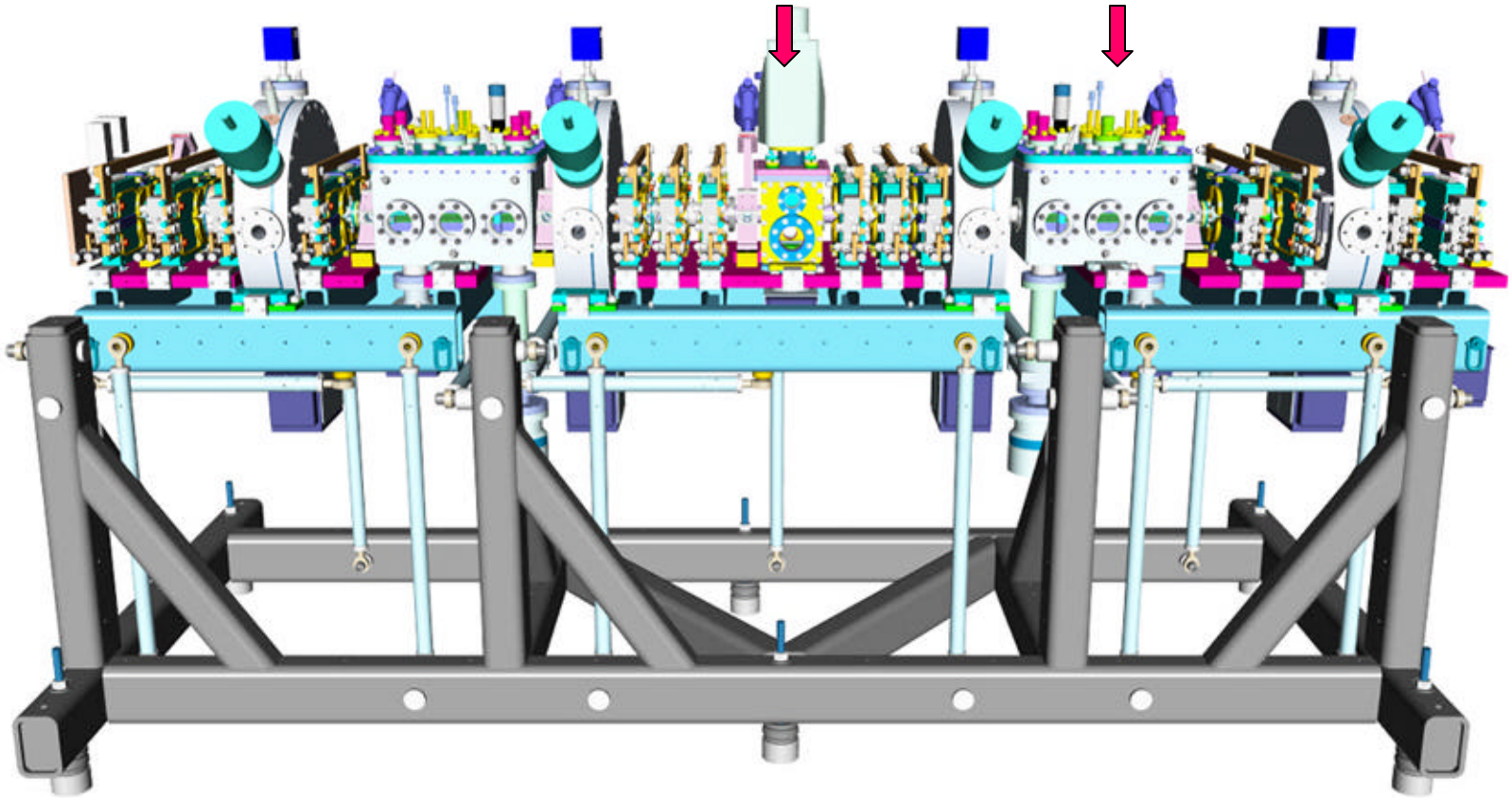
Tail is reduced significantly even without collimators

(Beam profile at 171MeV)



Blue: Baseline MEBT Red: Modified MEBT

Locations of collimators



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MEBT ASSY
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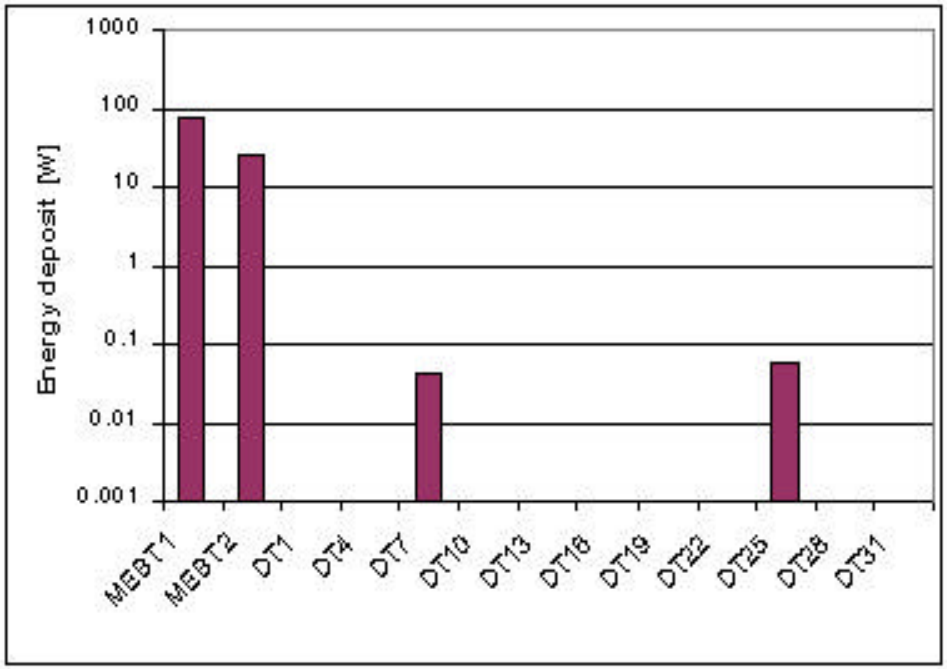
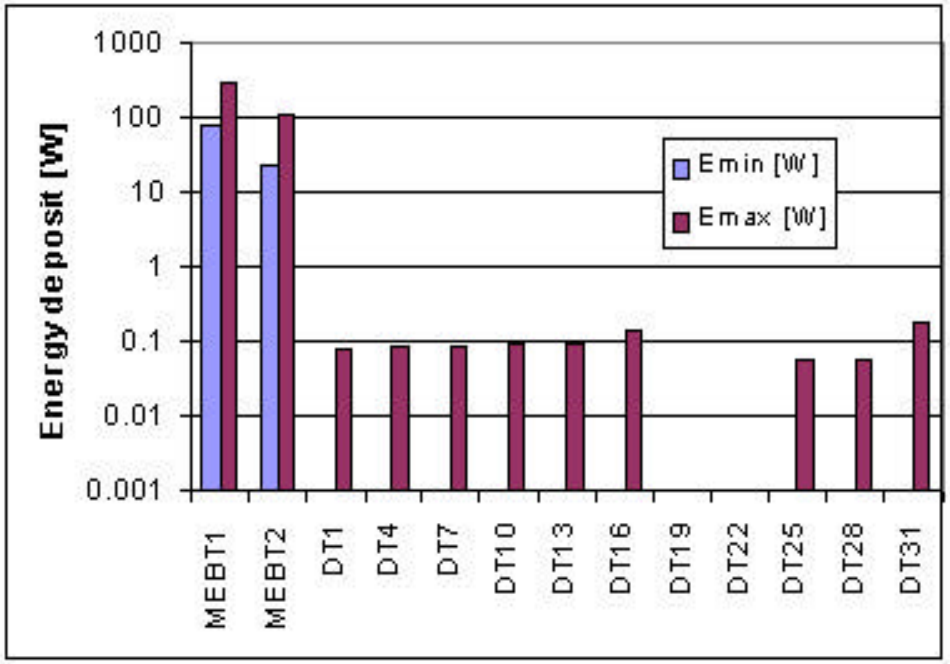
8mm DTL apertures intercept very little particle



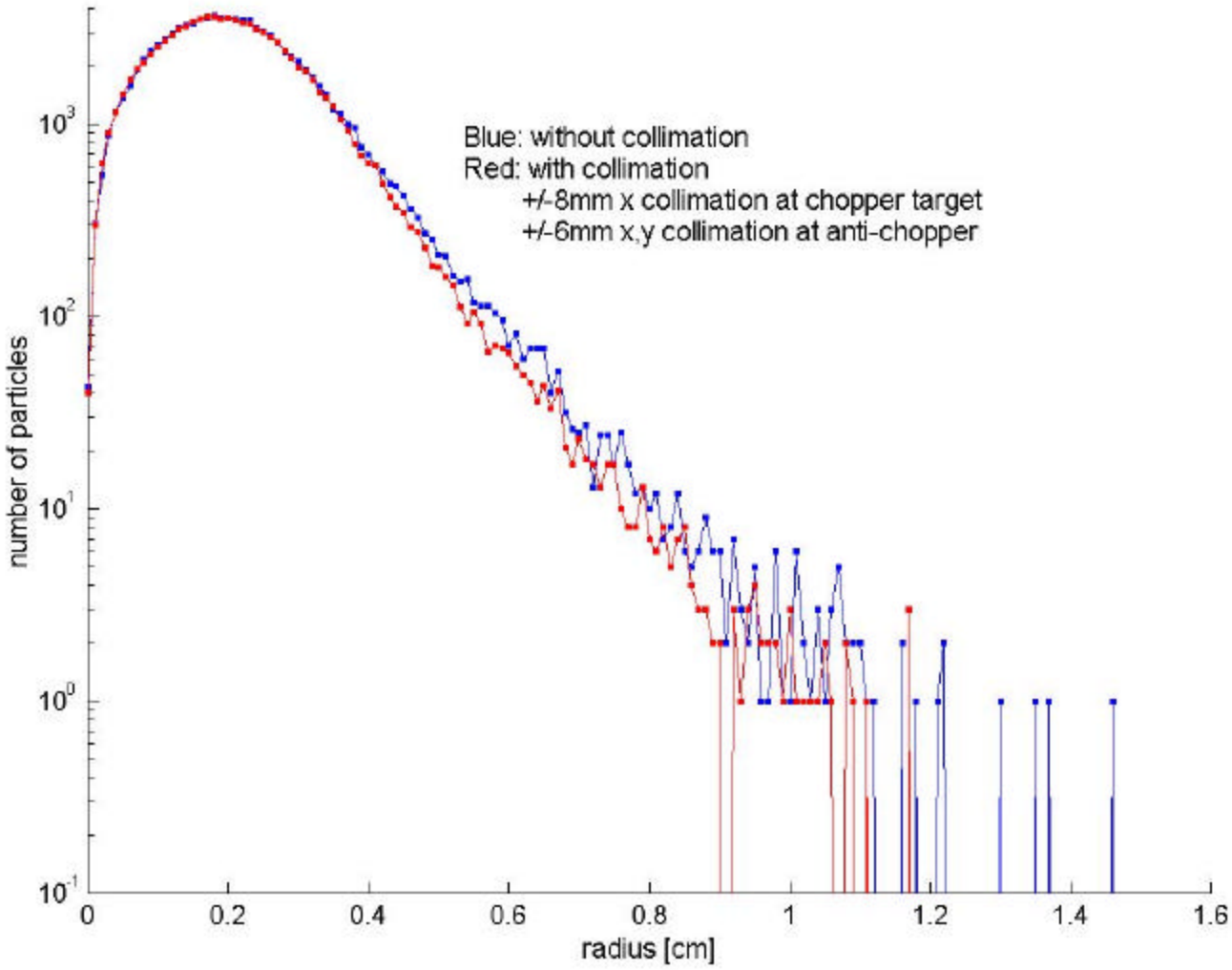
Energy deposit to scrapers
without machine imperfections



Energy deposit
with machine imperfections

+/-8mm x scraper at chopper target
+/-6mm x,y scraper at anti-chopper box
8mm DTL scrapers at empty drift tubes

Collimation in MEBT eliminates tail further



- **Modified MEBT optics greatly reduce tail.**
- **Collimation at the chopper target and anti-chopper box eliminates tail further.**
- **DTL collimation seems unnecessary.**
- **Further study is under way.**