**Booster Notching Absorber Assembly**

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The conceptual design of the Booster Notching Absorber is based on **Primary beam loss calculations at notching** prepared by Sasha Drozhdin and **Energy deposition simulations with MARS** prepared by Igor Tropin. The New Booster Notching Absorber is located in the Long 13 of the Booster Ring.



Fig.1 Long 13 before the Notch Absorber Installation.

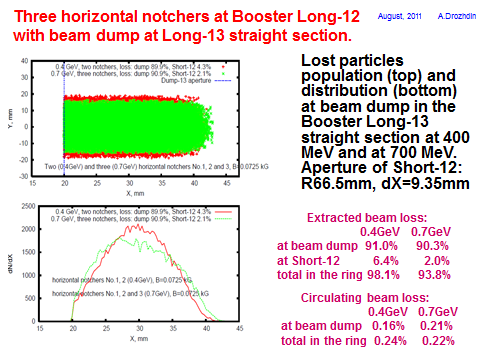




Fig.2 Vacuum Liner, neutral position. Fig.3 Vacuum Liner, working position.

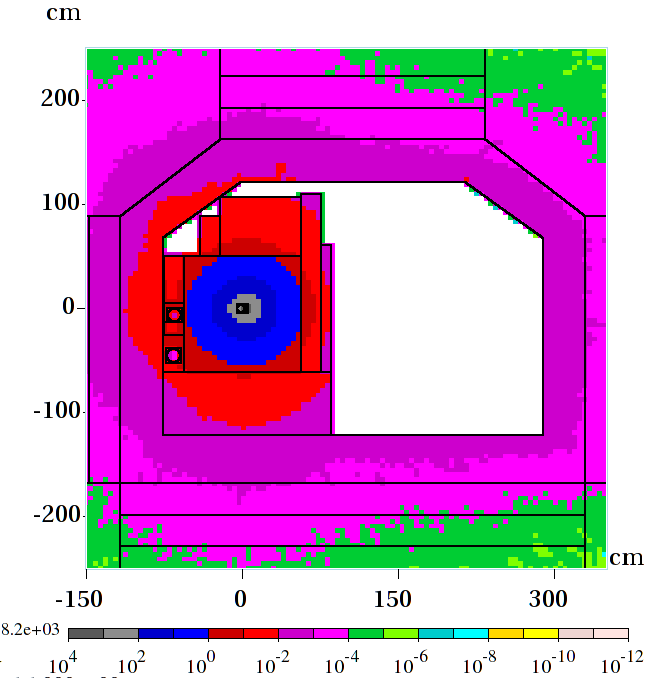


Fig.4 Energy deposition, MARS Calculations (residual dose).

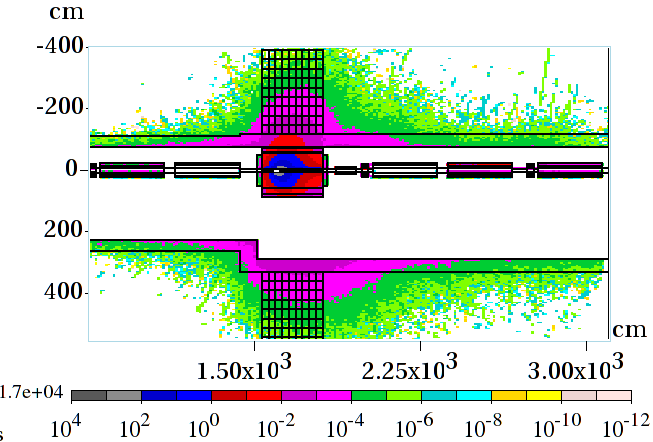


Fig.5 Energy deposition, MARS Calculations, plan view (residual dose).

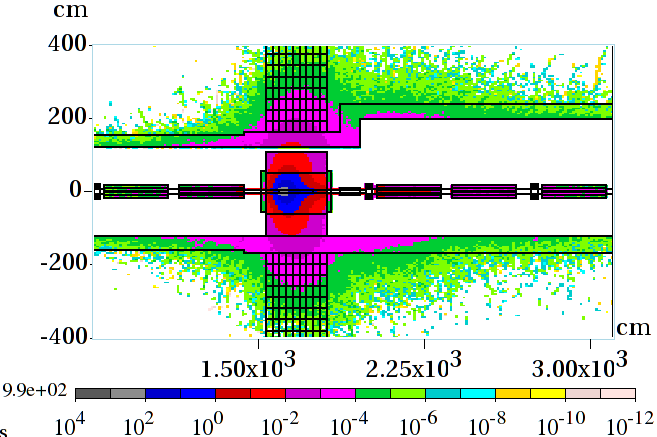


Fig.6 Energy deposition, MARS Calculations, vertical view (residual dose).

**Booster Notching Absorber Components.**

The vacuum liner (item 1) is surrounded with steel absorber (item 2) and concrete (item 3) blocks. Polyethylene masks (item 4) are mounted around the vacuum liner tube extension in the upstream and downstream ends of the absorber. The driving system (item 5) provides 1.00” movement of the vacuum liner inserted into the moving block (item 6) . Two bellows (item7) are connected to the vacuum liner and to the Booster beam pipe. The marble plates ( item 8 and 9), are installed on the aisle side and downstream end of the absorber. The steel –marble mask ( item 10) is installed on the downstream end of the absorber. Three steel frames (item11) are holding marble and concrete blocks in the place.



5

4

3

11

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7

10

9

1



8

6

Fig.7 Booster Notch Absorber.





Fig. 8 Wall shielding and base concrete blocks installation.





Fig. 9 Notch Absorber steel blocks assembly.



Fig. 10 Downstream end of the Absorber.



Fig. 11 Upstream end of the Absorber.

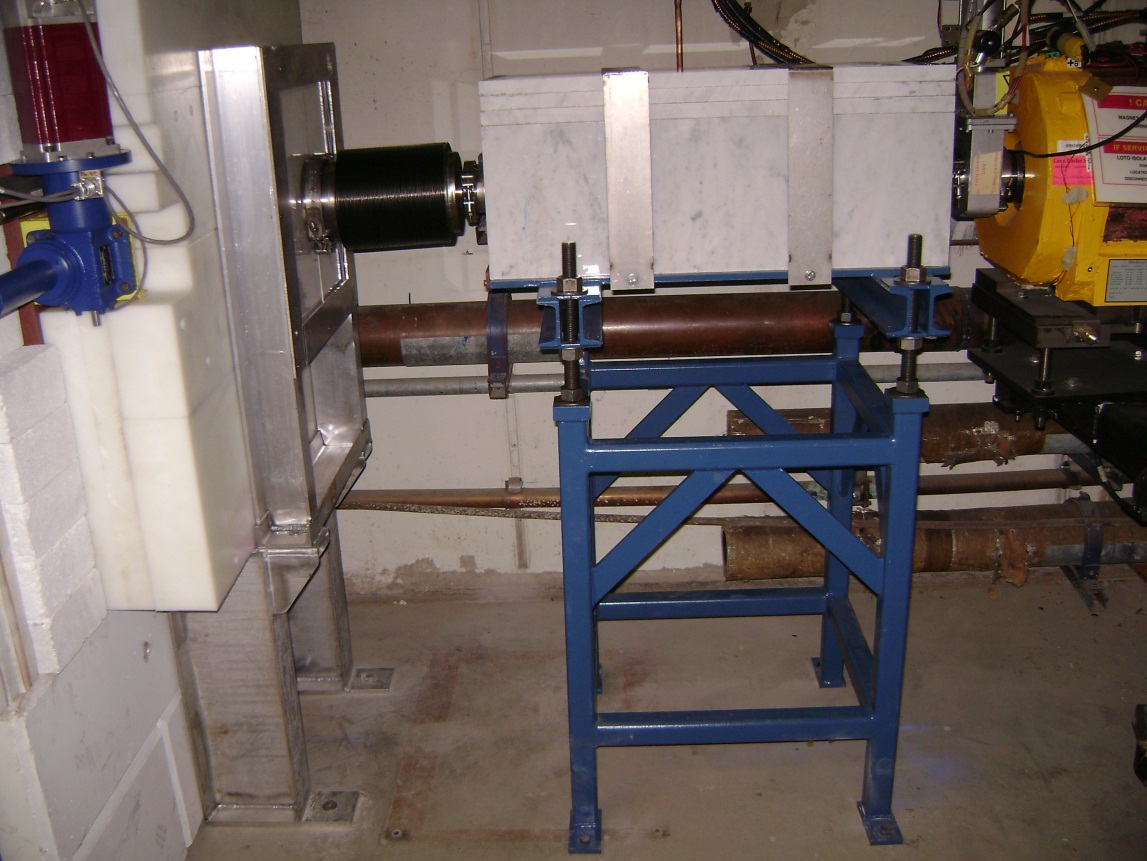


Fig.12 Downstream end bellows and Steel-Marble mask .



Fig. 13 Upstream end bellows and Ion pump port.

**Alignment measurement data**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **BASELINE2 Measurements::NOTCH Export Field.txt1** | | | | |  |
| **Point Name** |  | **X** | **Y** | **Z** |  |
| NOTCH\_UP |  | -0.005 | 35.300 | 0.018 |  |
| NOTCH\_CT |  | -0.006 | 89.527 | 0.021 | ADJUSTED BY JERRY JUDD TO ZERO THE UPST END |
| NOTCH\_DN |  | -0.008 | 143.755 | 0.024 |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Point Name** |  | **X** | **Y** | **Z** |  |
| NOTCH\_UP |  | -0.617 | 35.299 | 0.002 |  |
| NOTCH\_CT |  | -0.619 | 89.526 | 0.020 | MOVED RADIALLY IN 23500 COUNTS |
| NOTCH\_DN |  | -0.621 | 143.753 | 0.038 |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Point Name** |  | **X** | **Y** | **Z** |  |
| NOTCH\_UP |  | -0.780 | 35.298 | 0.002 | MOVED RADIALLY IN 7000 COUNTS . UPST LIMIT LIT |
| NOTCH\_CT |  | -0.782 | 89.526 | 0.020 | DNST LIMIT UNLIT |
| NOTCH\_DN |  | -0.785 | 143.753 | 0.039 |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| NOTCH\_UP |  | 0.327 | 35.299 | 0.018 |  |
| NOTCH\_CT |  | 0.324 | 89.527 | 0.020 | MOVED RADIALLY OUT 2500 COUNTS |
| NOTCH\_DN |  | 0.321 | 143.754 | 0.023 |  |

**Summary:**

1. **The Notch Absorber is successfully and safely assembled in the BOOSTER Long 13.**
2. **The Notch Absorber is assembled with acceptable vacuum liner moving parameters: from 0 position toward beam center 0.79” ( 20mm), from 0 toward aisle side 0.277”**

**( 7mm).**