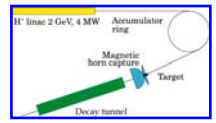
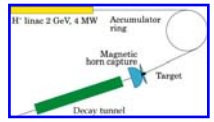


Dose Rate Studies

E.B on behalf of IPHC group

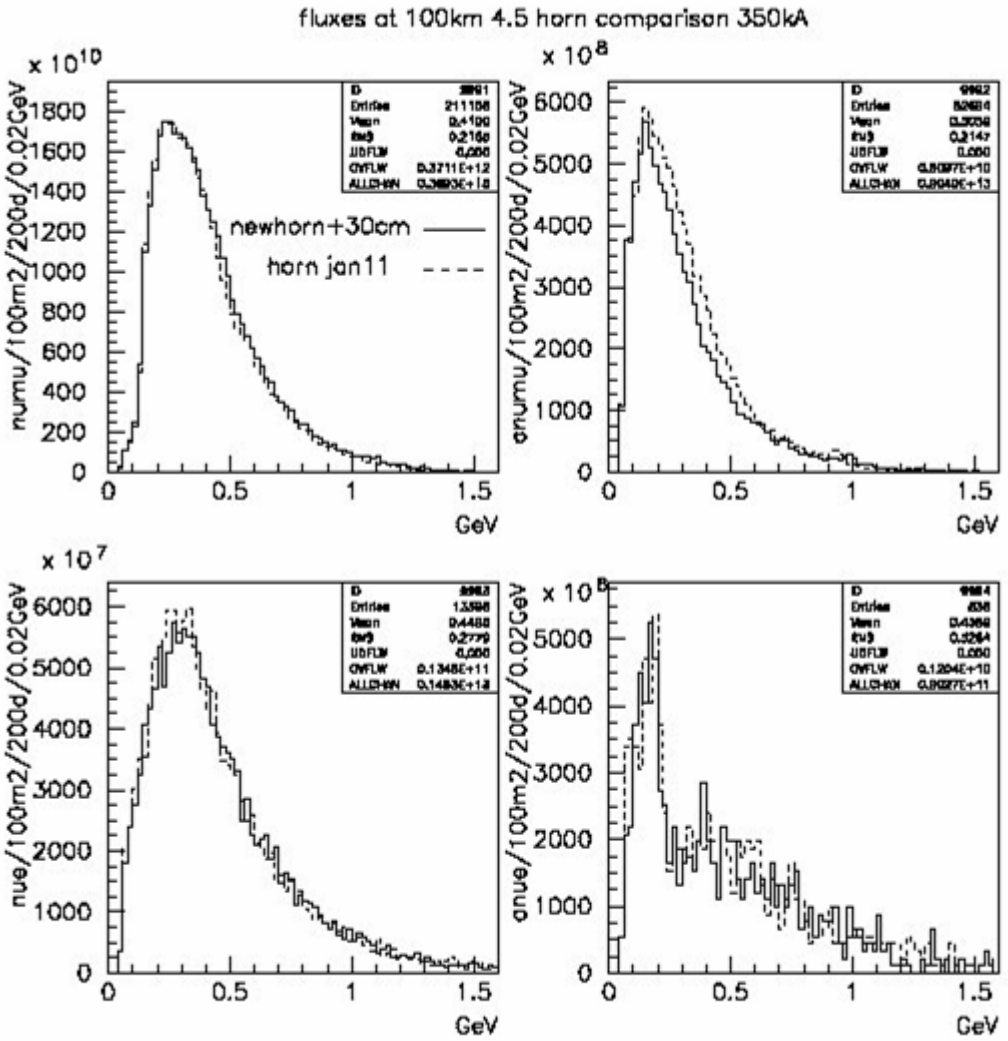
Safety Issues for WP2

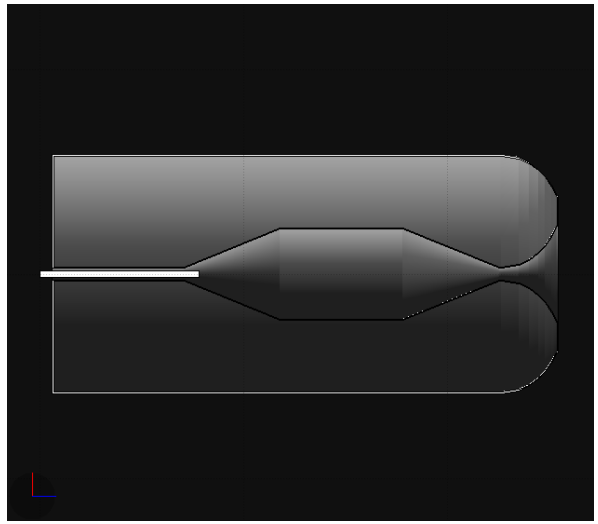


Outlines:

- Introduction
- Neutrino flux with actual horn design
- Power Station Implantation
- Dose Rate Estimation

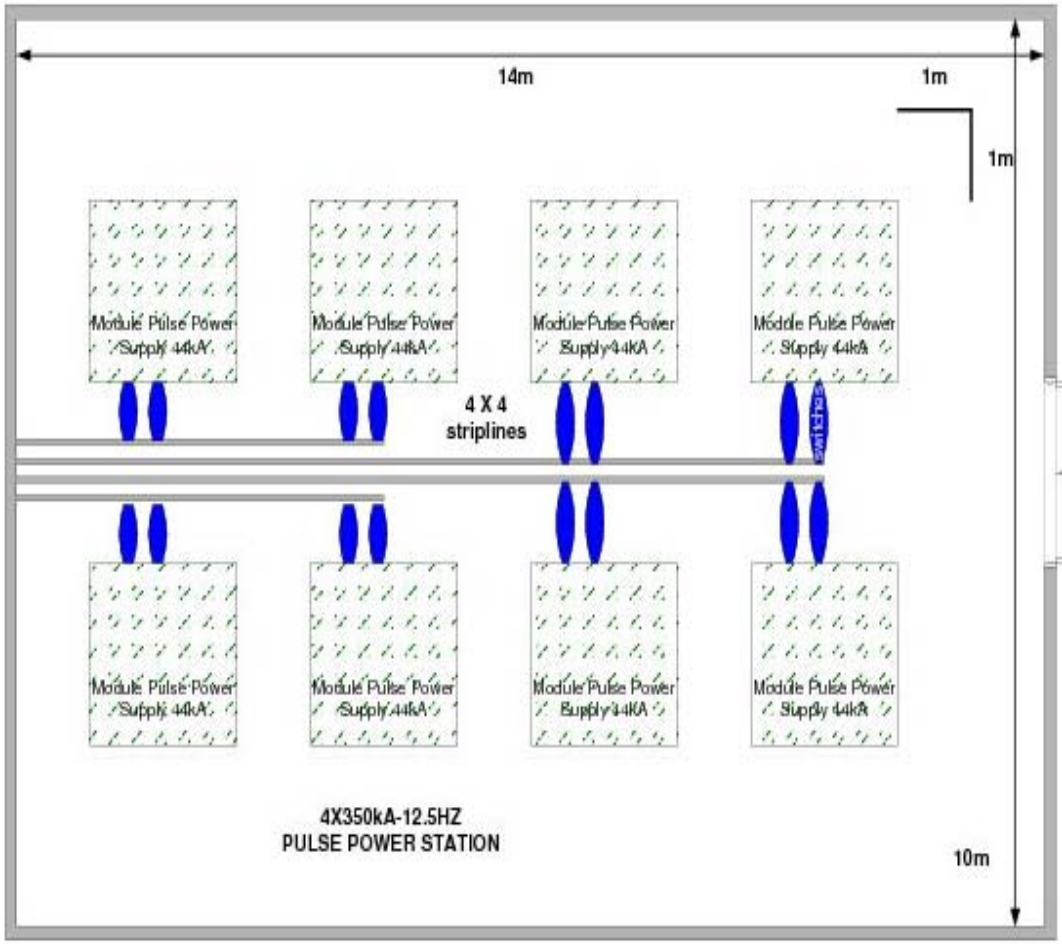
SPL Flux with new horn

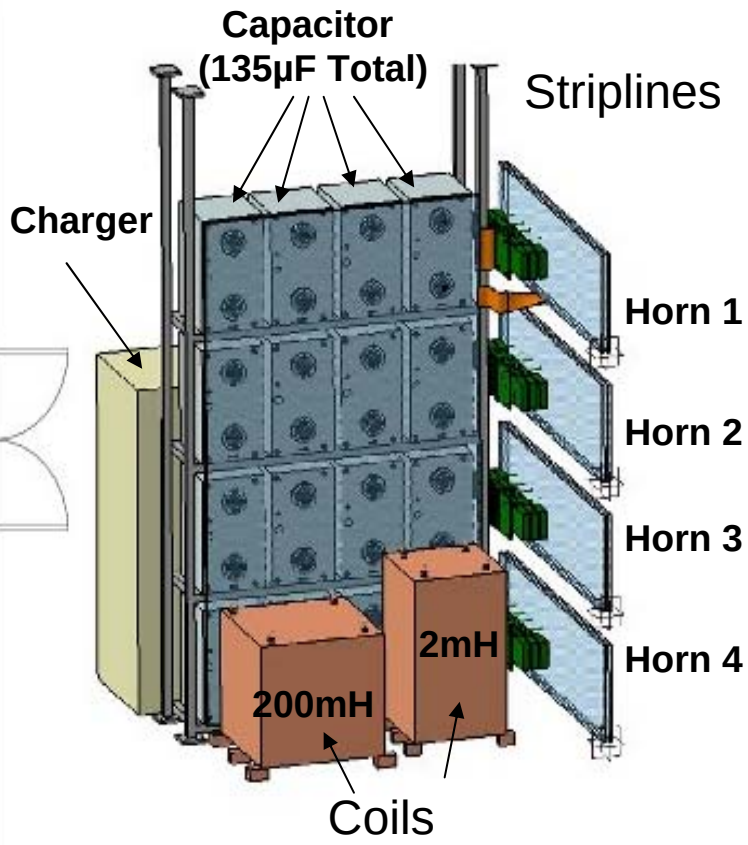




New horn +20cm
65% titanium density

Design Pulsed Power Station Implantation



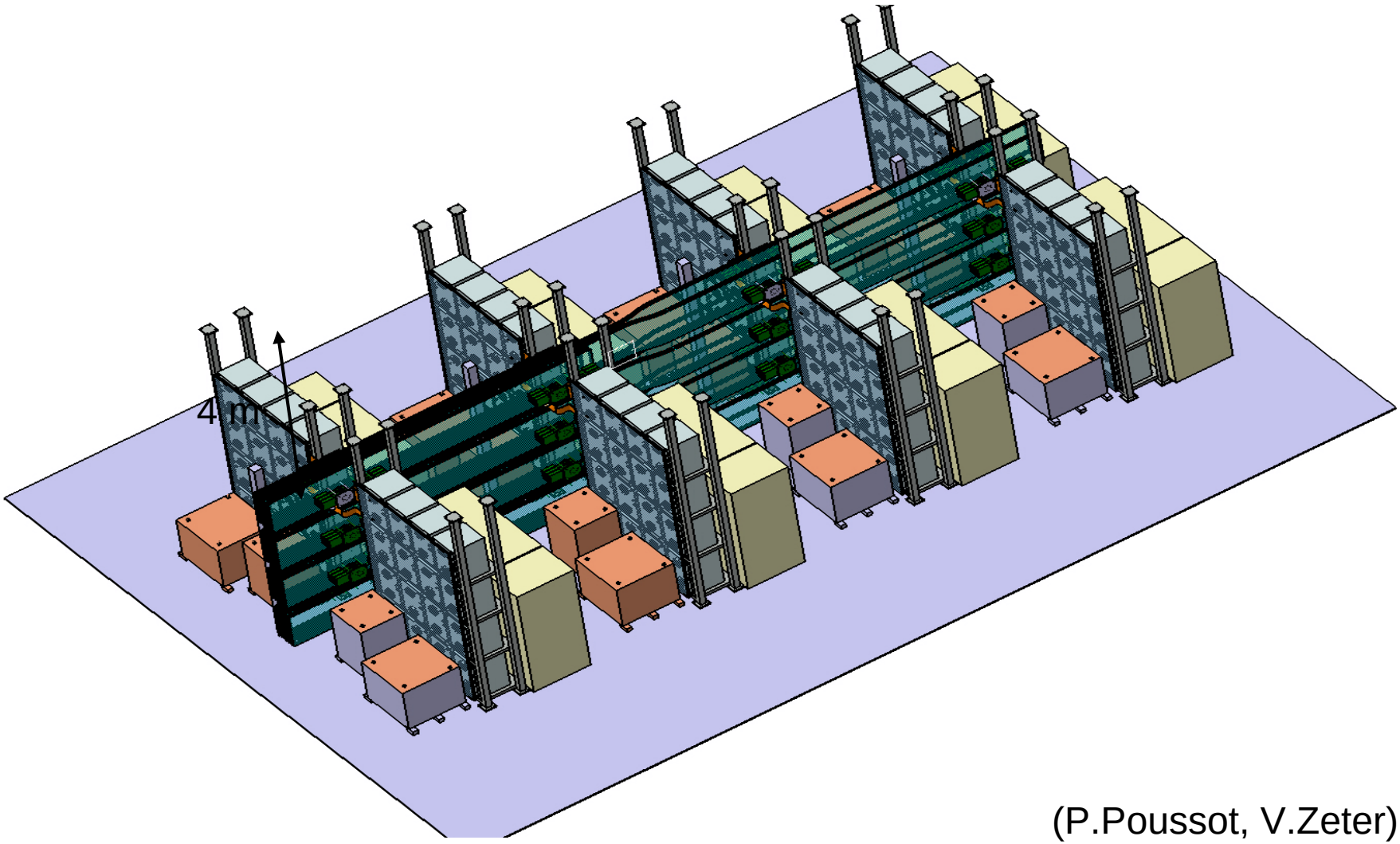


Module Pulse Power Supply 44kA **Weight (4,8 tons)**

Design Pulsed Power Station Implantation

(P.Poussot, V.Zeter)

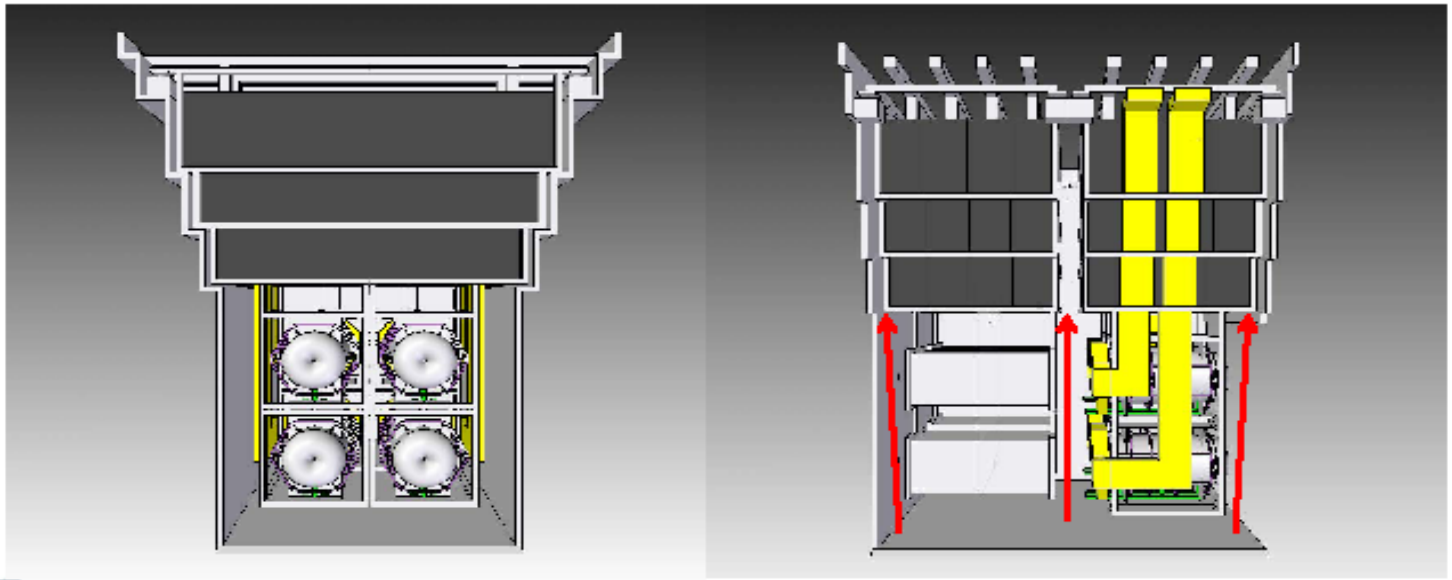
Design Pulsed Power Station Implantation



(P.Poussot, V.Zeter)

Shielding Design

- Assumed shielding requirement: 2.2m steel + 3m concrete
- Where possible, stepped blocks will be used to eliminate direct shine paths
- To allow clearance for blocks to be lifted, some gaps are unavoidable
- The effects of this must be taken into account when specifying shielding requirements



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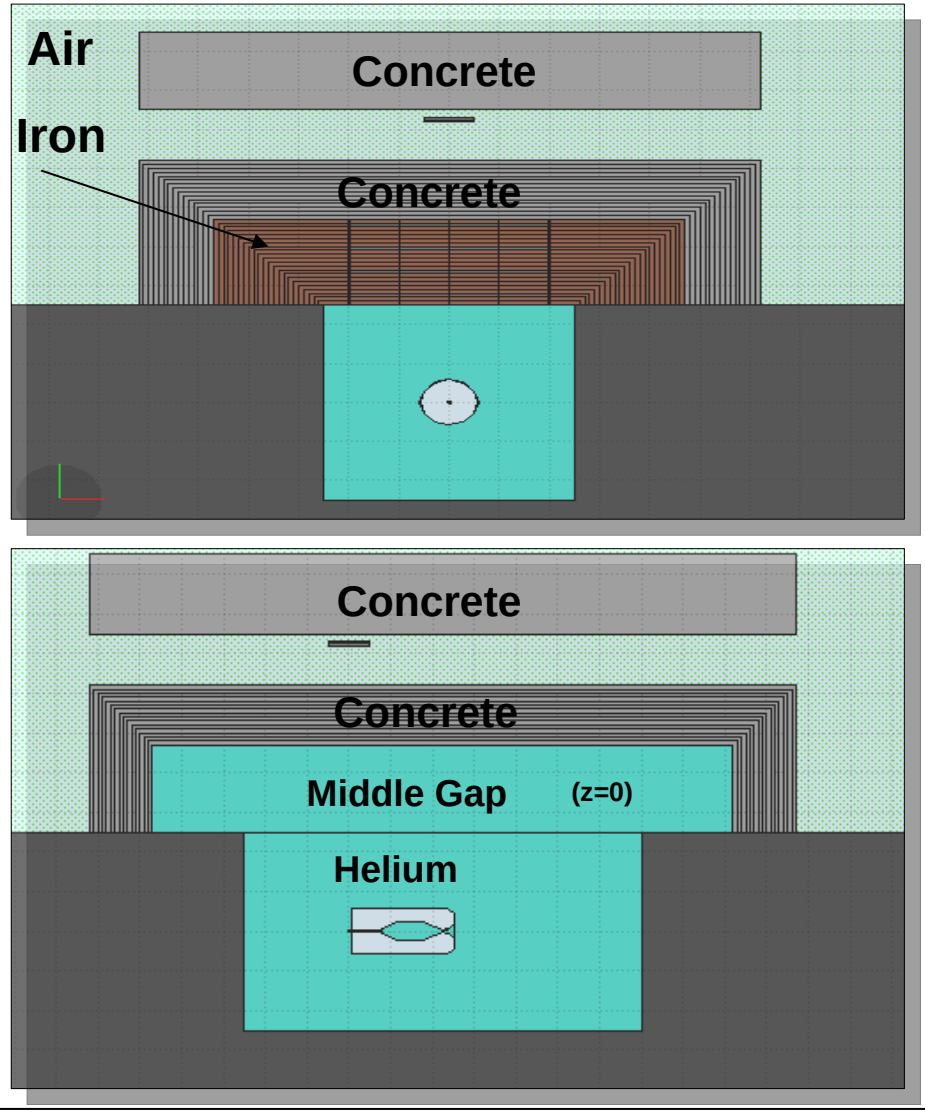
Target Station Simulation : Prompt Radiation

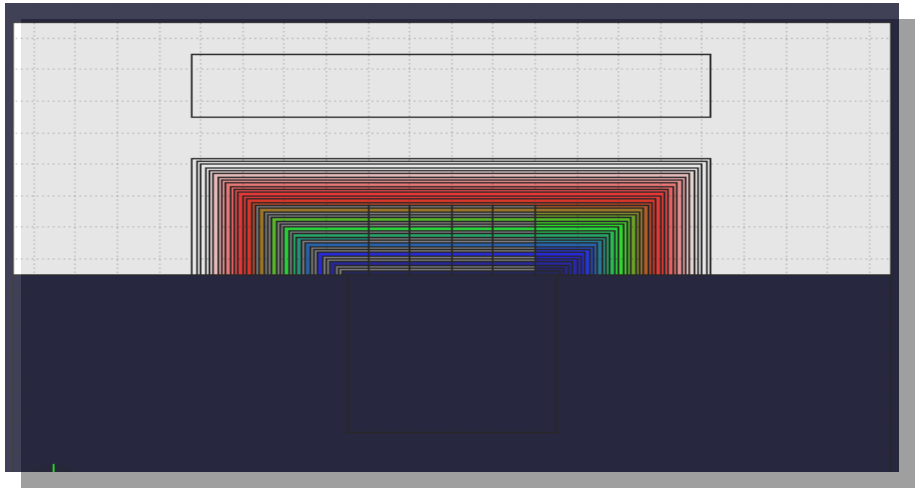
Simulation geometry :

- Open-Top shielding configuration (T2K)
- FeedThroughts 1cm crossing the iron (5 slabs along beam axis)
- Power Beam 4MW (One Horn Approx Study)
- Only upstream particle inside the chamber are transpored to reduce computing time
- Four-Horns to follow with 10^8p.o.t.

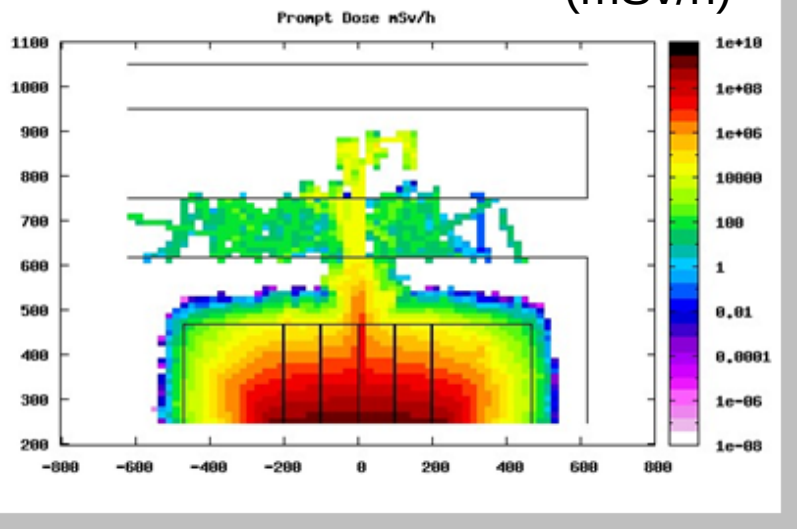


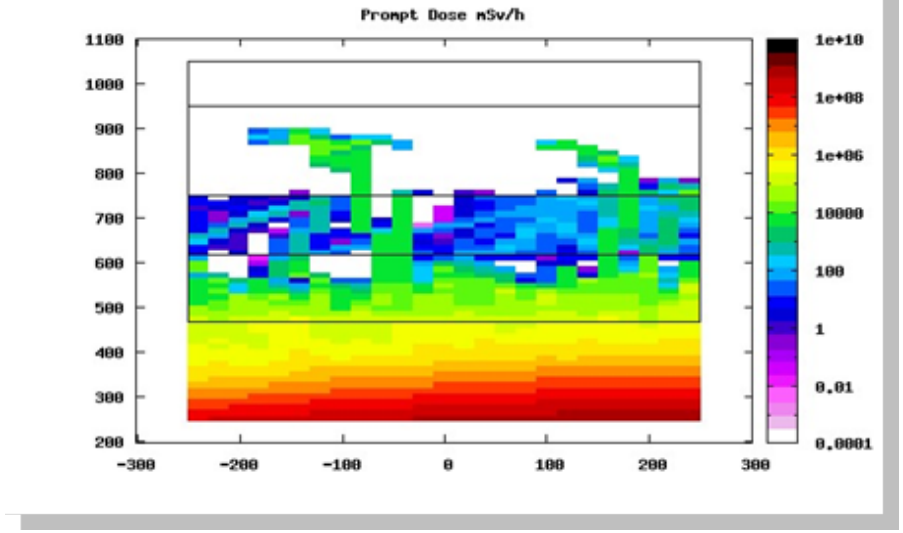
Target Station Simulation : Prompt Radiation

- **Importance biasing method for neutrons**
- **Compensation factor related the attenuation inside all materials**
- **1000000 simulated events**

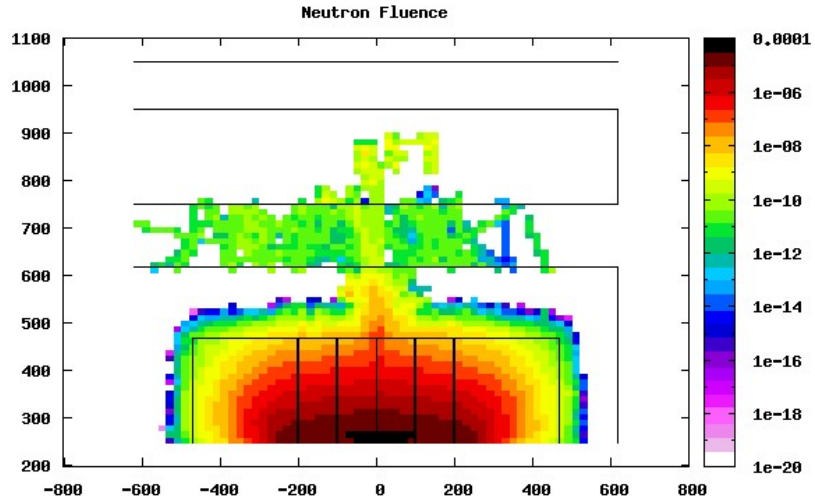


(mSv/h)

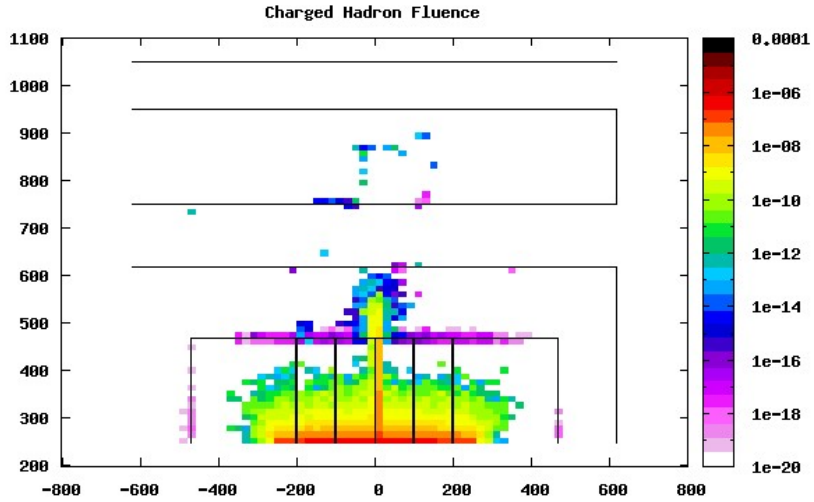




Transverse section :

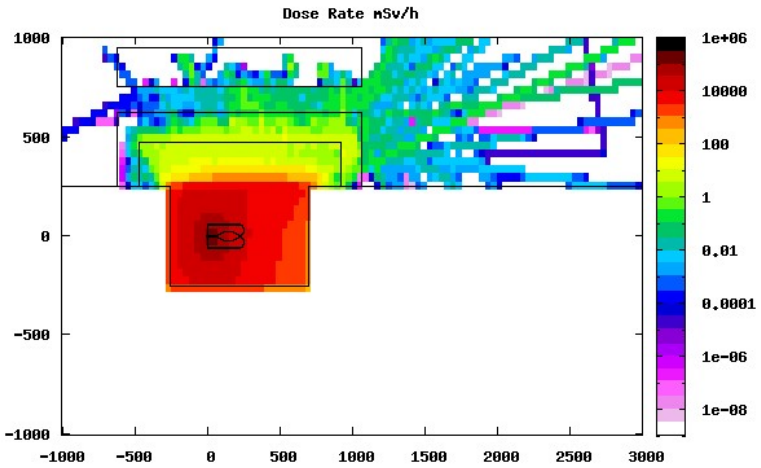


Neutron fluence



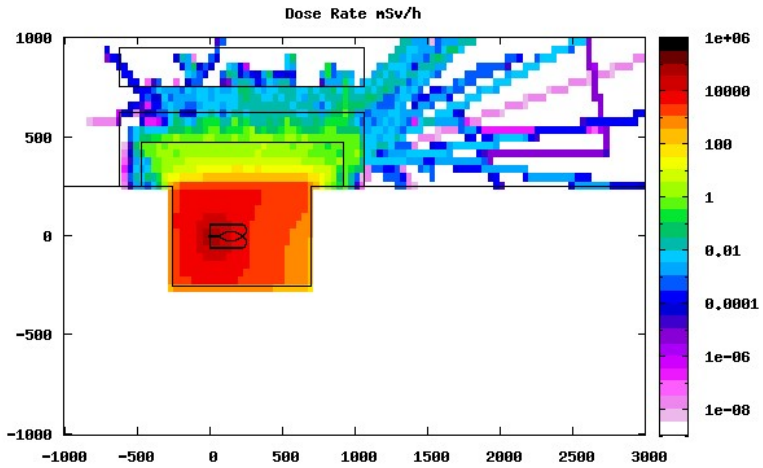
Charged Hadron Fluence
(no biasing)

Target Station Simulation : Residual Dose

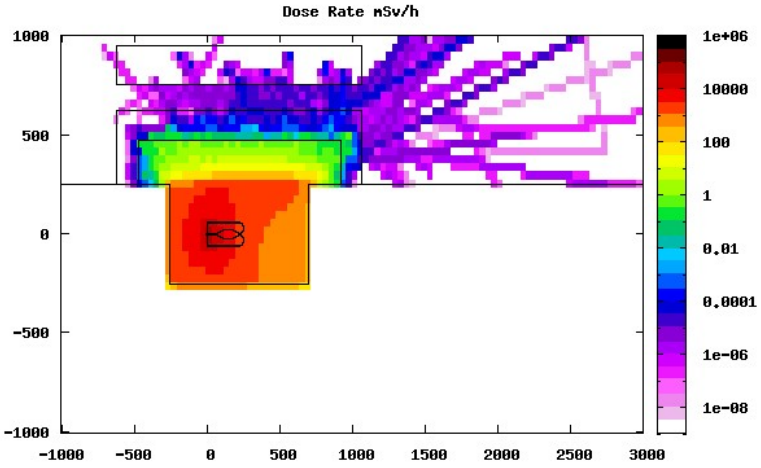


After 0 day

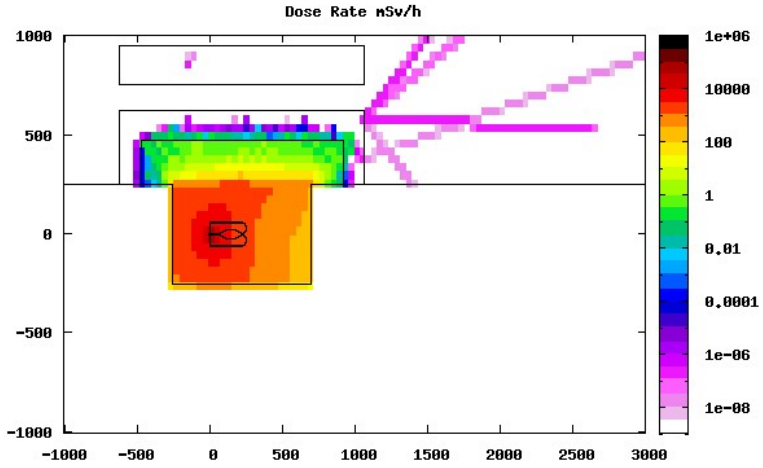
(mSv/h)



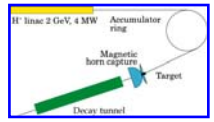
After 1 day



After 1 week



After 1month



Next :

- Update/improve geometry with four horns fore seen gap implementation.
- Run Fluka simulation on grid computing system 10^8 p.o.t.