

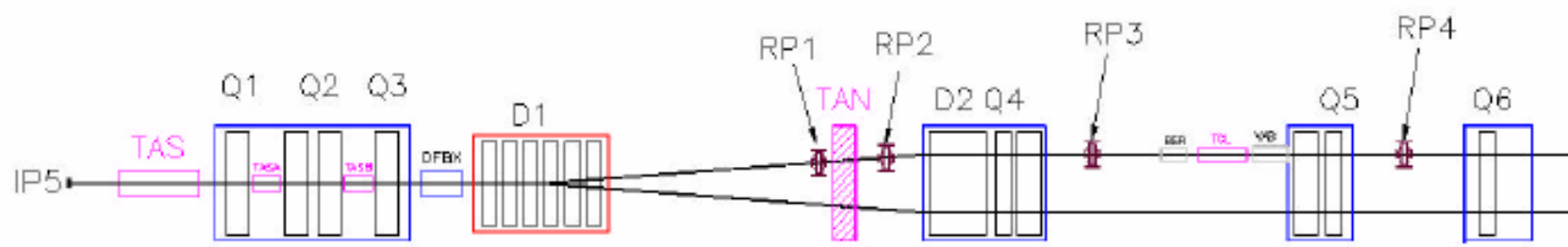
Modeling Radiation Load to Forward Detectors

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for FNAL AD Energy Deposition Group

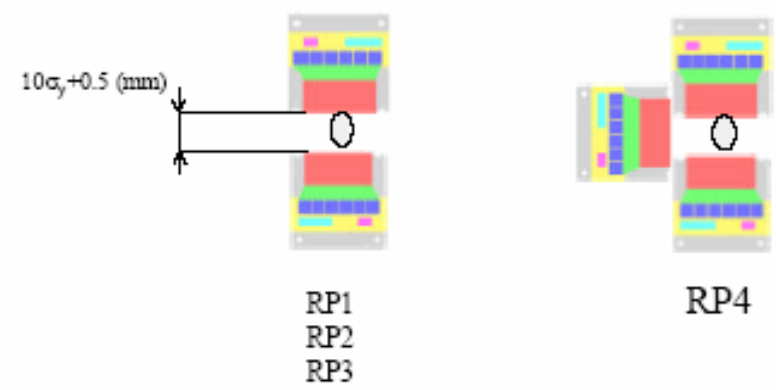
N. Mokhov, A. Drozhdin, I. Rakhno

- Consistent detailed MARS model of IP1/IP5 region extended up to 420 m with **ALL** essential details of FP420 detectors and accelerator components in that region.
- Background (machine and *pp*-collisions) simulations.
- Acceptance modeling.
- Modeling radiation loads to FP420 components and radiation environment (accumulated and residual dose) in that region.

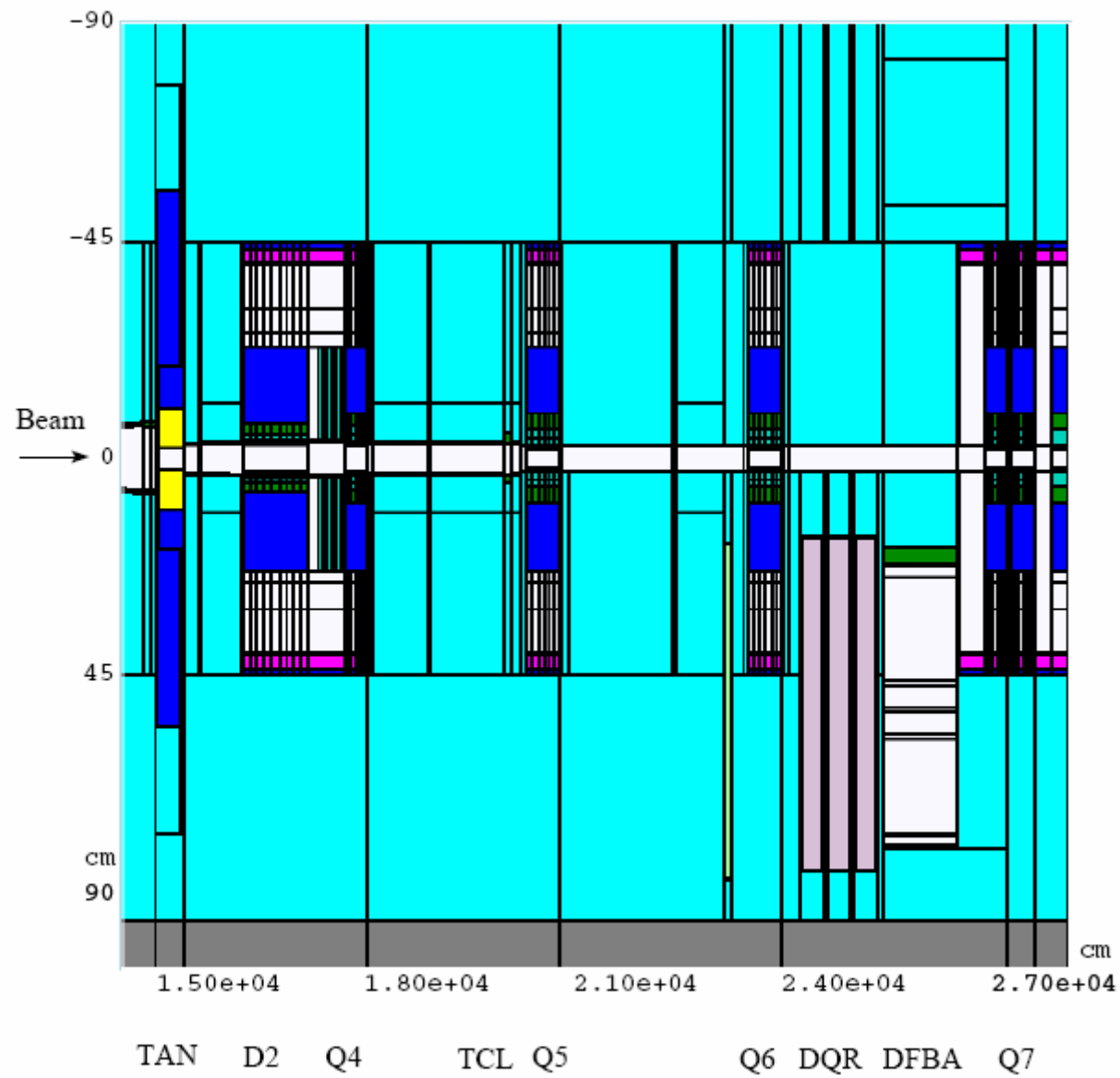


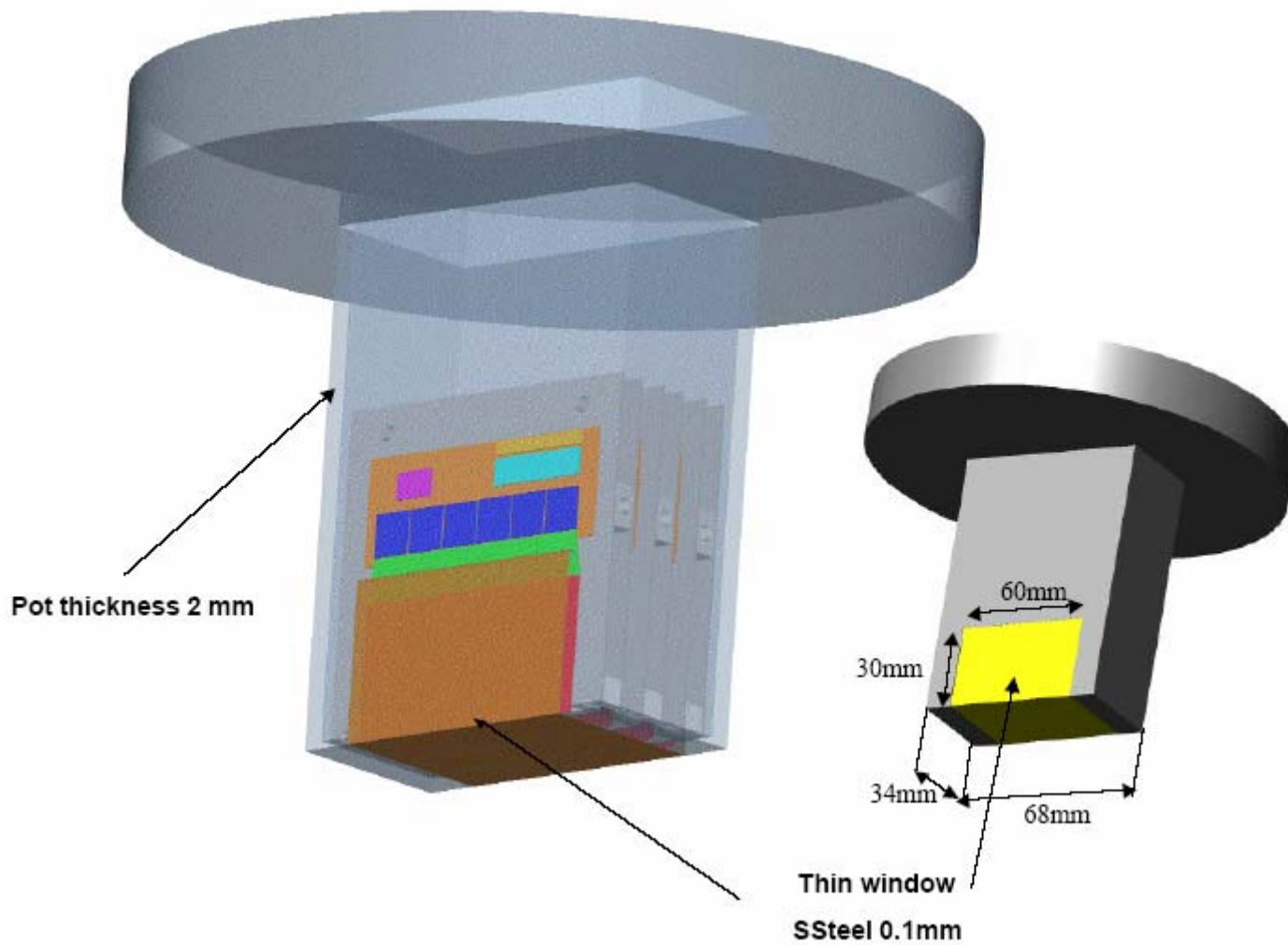
$\beta^* = 0.5 \text{ m}$

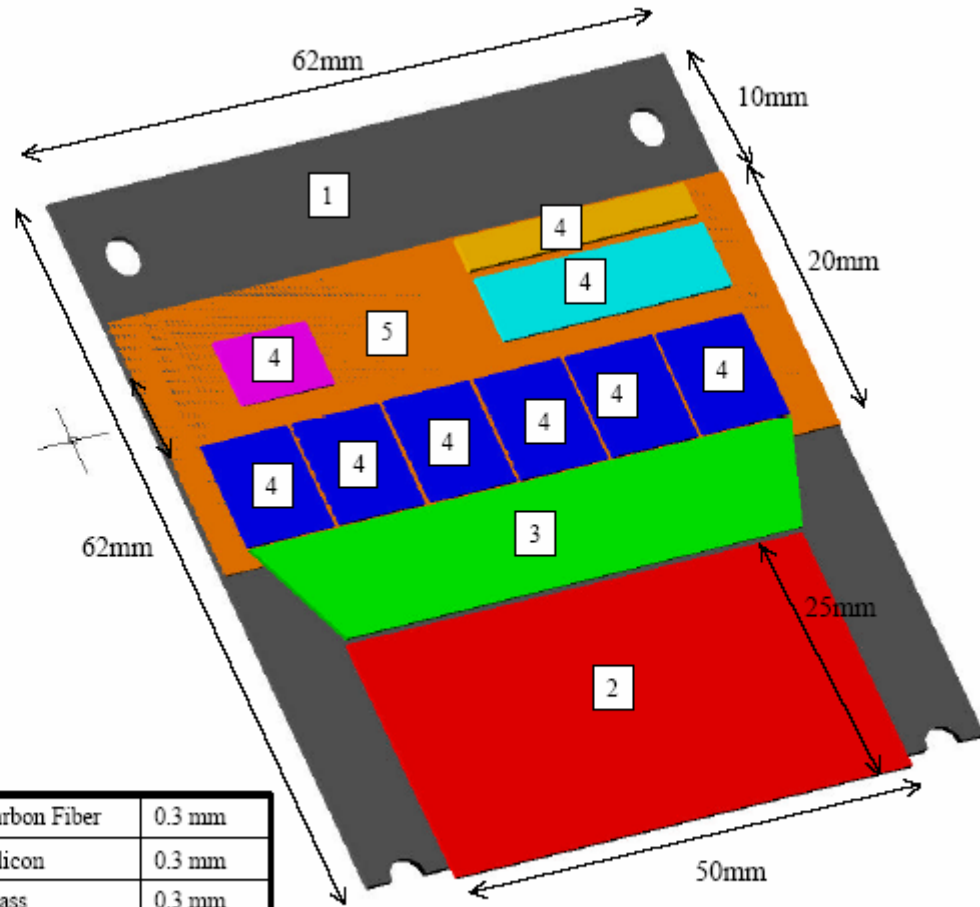
	z (m)	σ_x (mm)	σ_y (mm)	$10 \times \sigma_y + 0.5$ (mm)	$10 \times \sigma_x + 0.5$ (mm)
RP1	140	0.707	0.938	9.88	/
RP2	150	0.611	0.930	9.80	/
RP3	180	0.378	0.791	8.41	/
RP4	215	0.150	0.540	5.90	1.90



LHC IP5

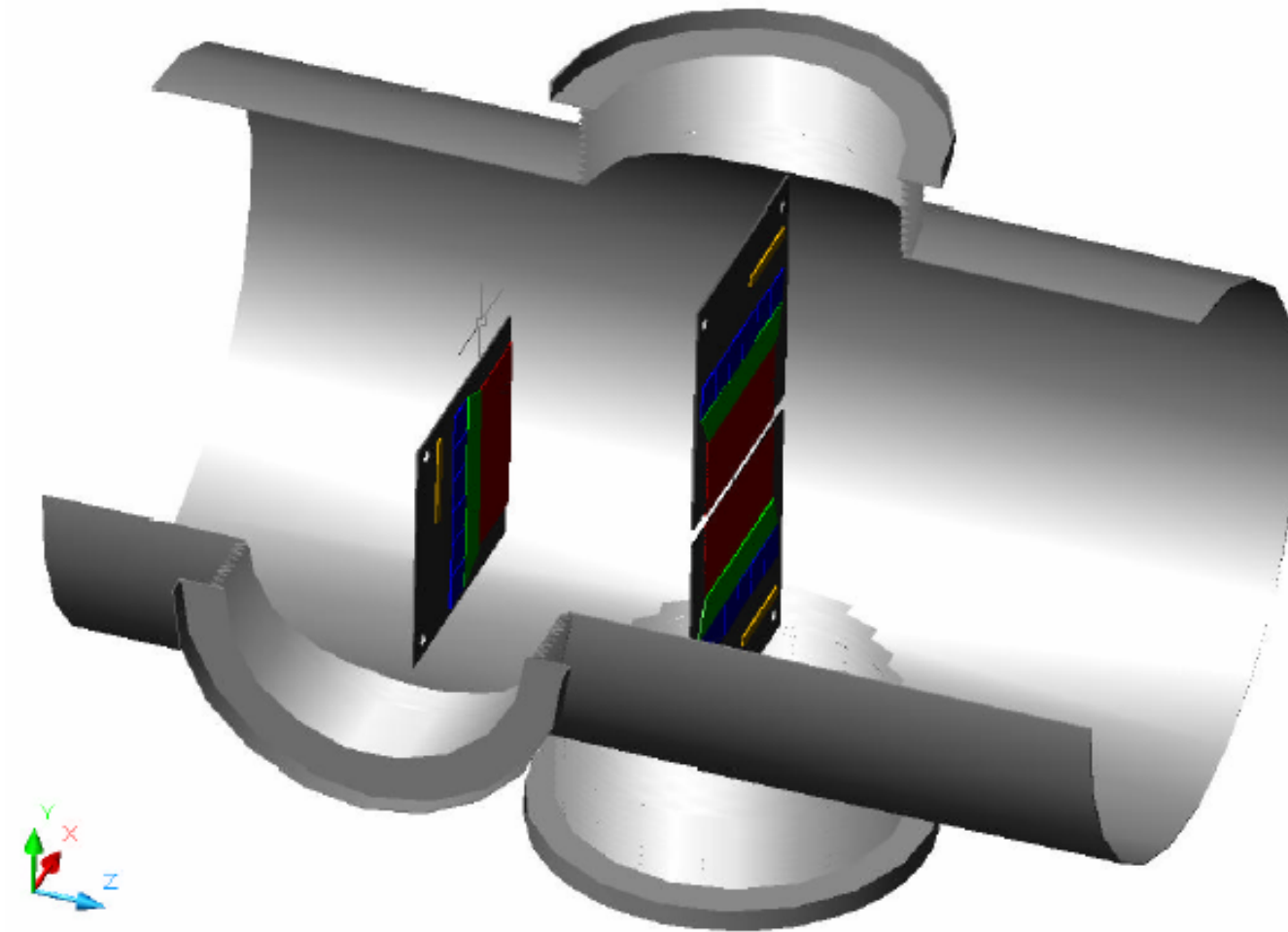




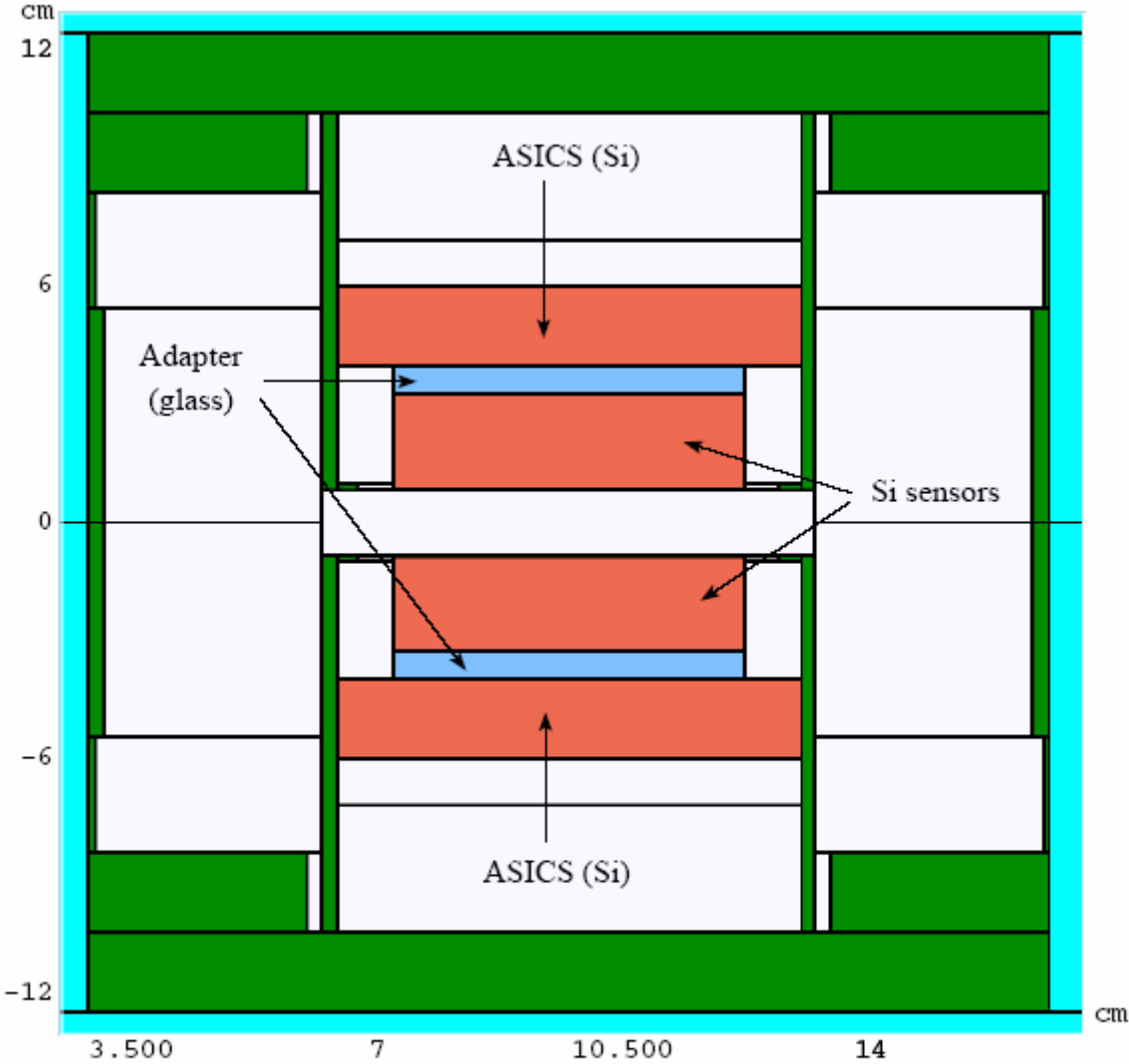


1	Frame	Carbon Fiber	0.3 mm
2	Sensor	Silicon	0.3 mm
3	Pitch Adapter	Glass	0.3 mm
4	ASICS	Silicon	0.25 mm
5	Hybrid	FR4	0.2 mm

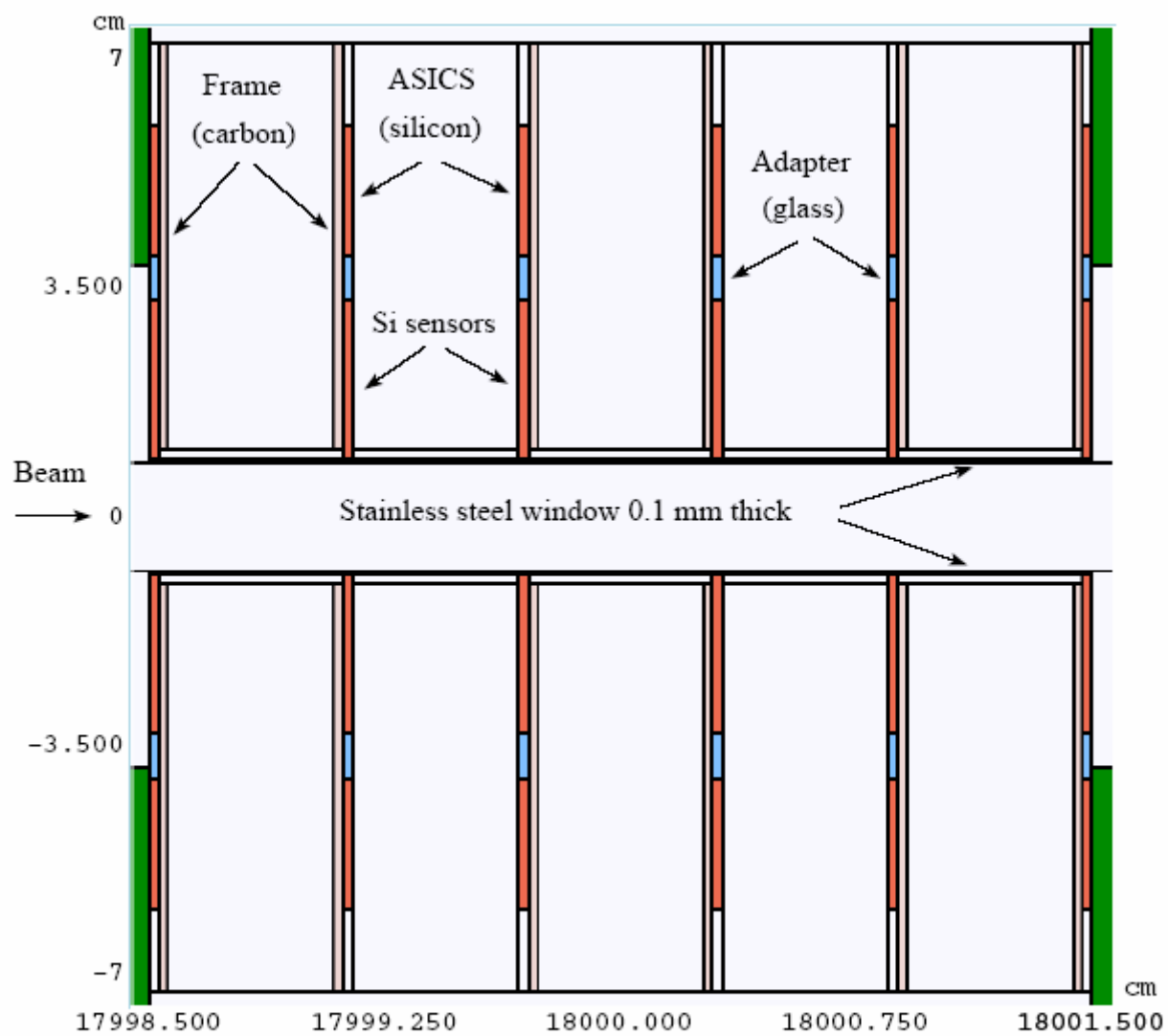
RP4 detectors arrangement

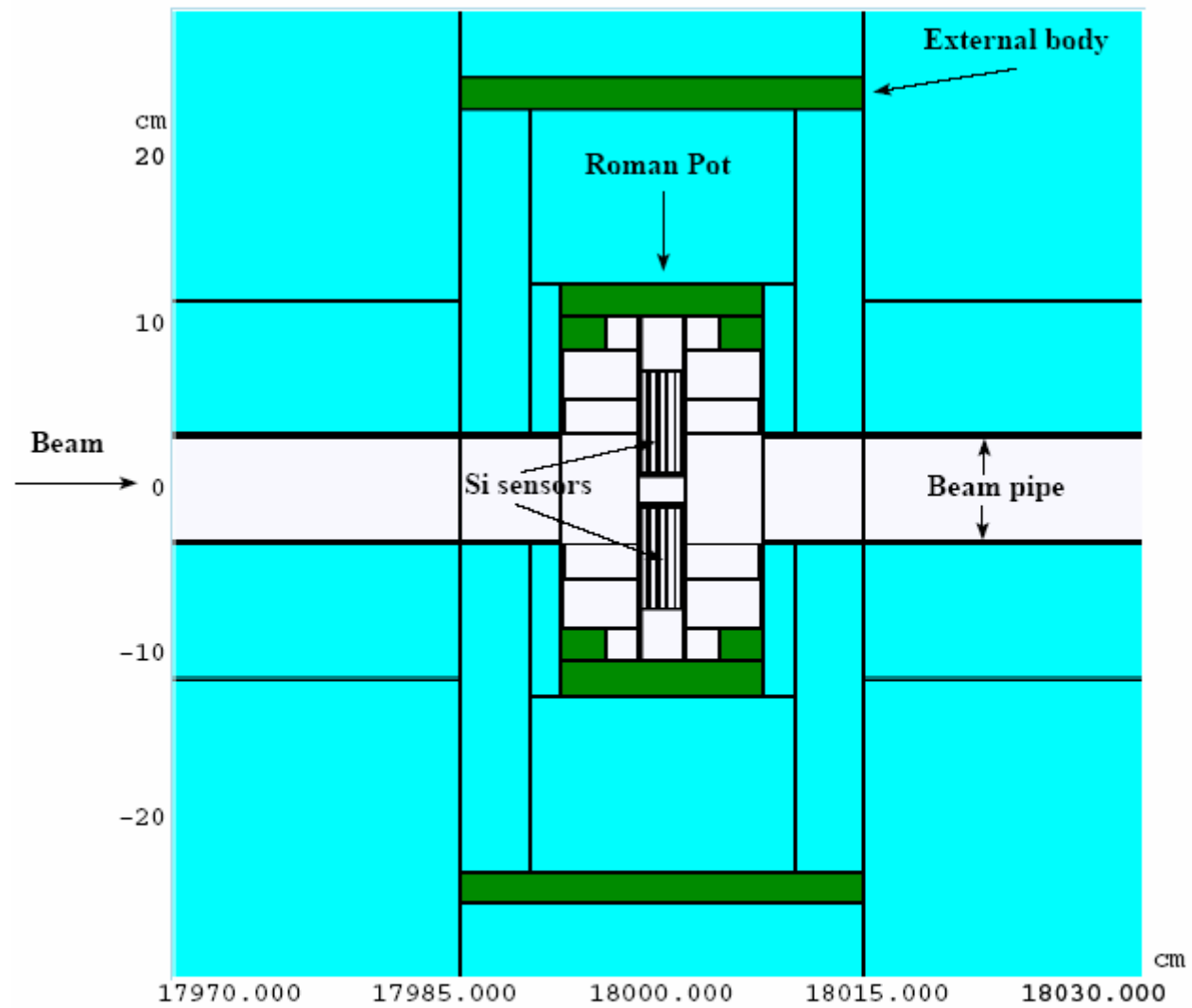


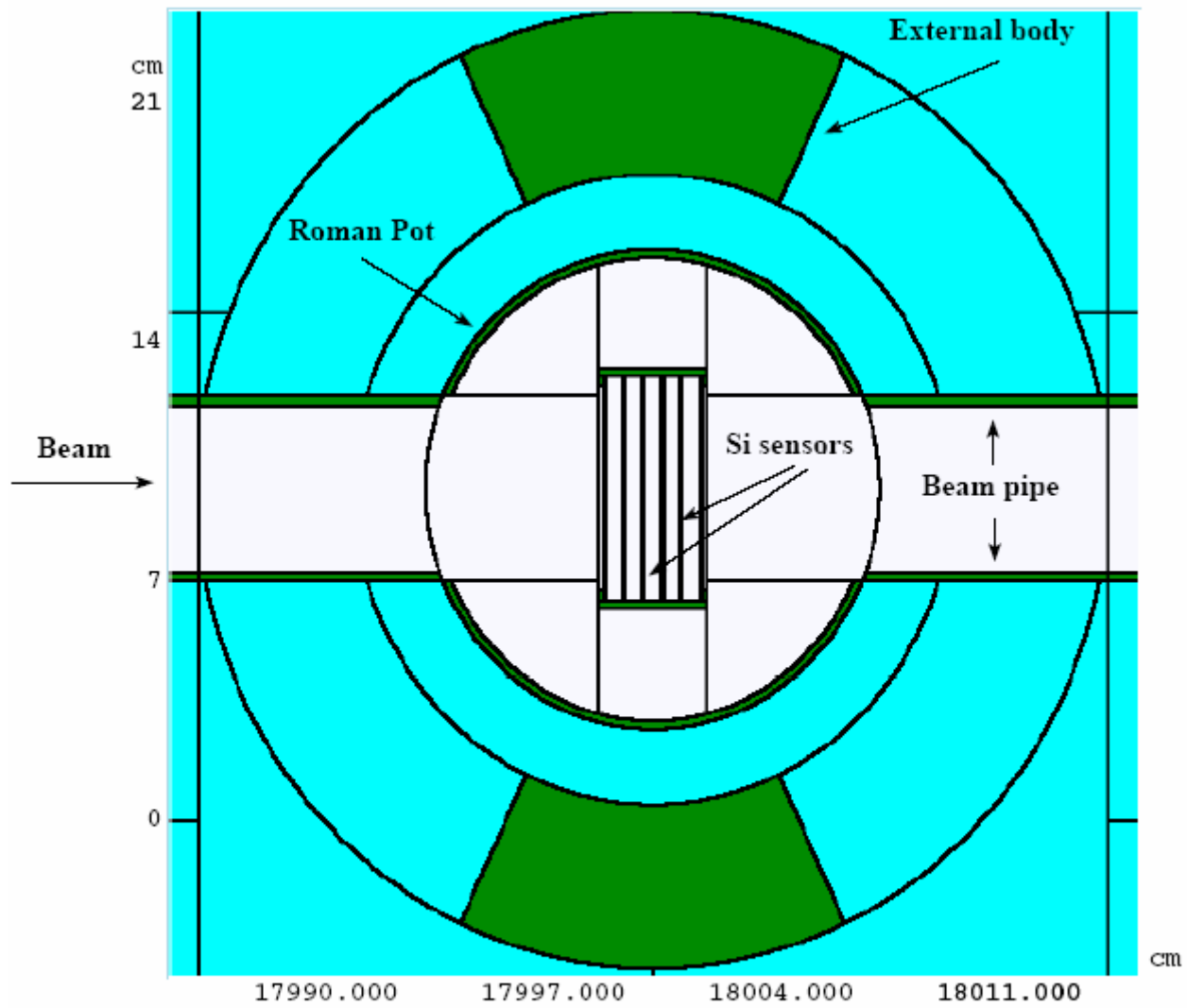
LHC IP5 Roman Pot 3



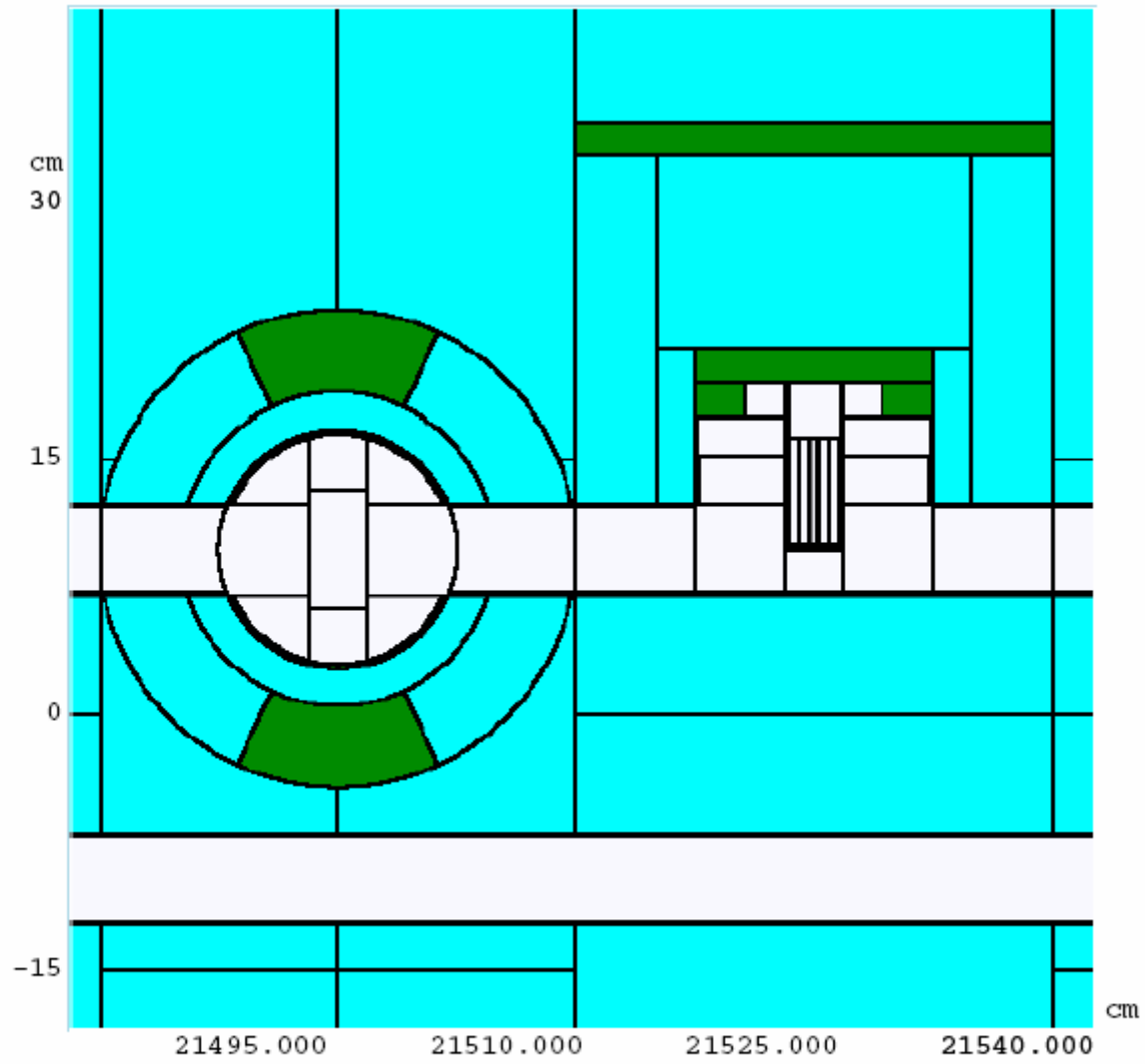
LHC IP5 Roman Pot 3





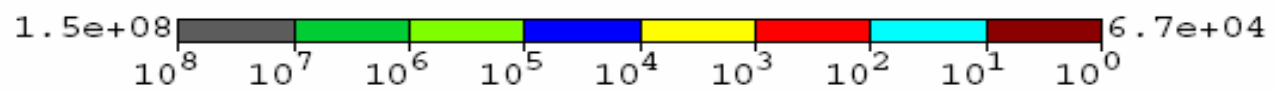
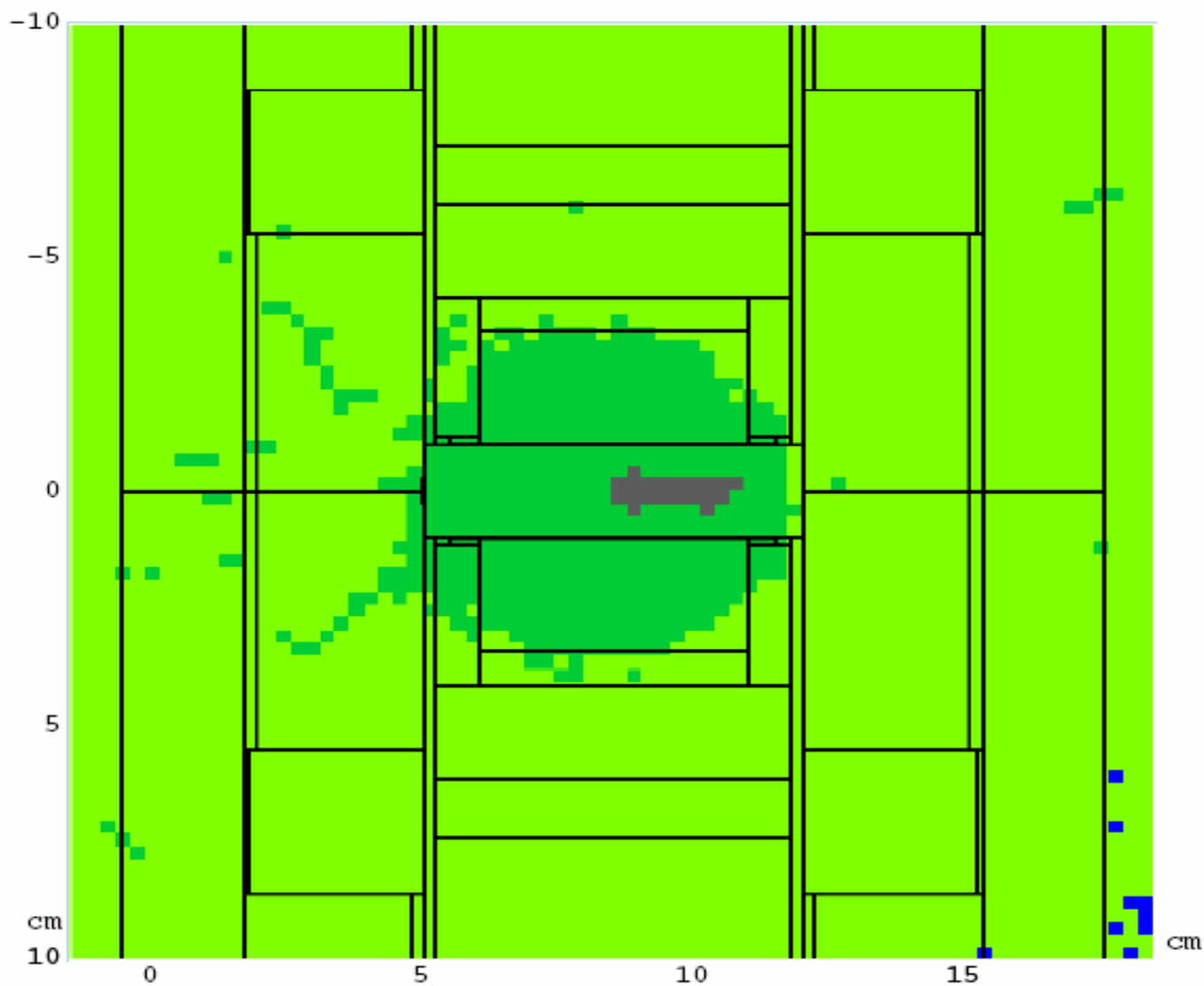


LHC IP5 Roman Pot 4



MARS14 (2002)

LHC IP5 Roman Pot 2

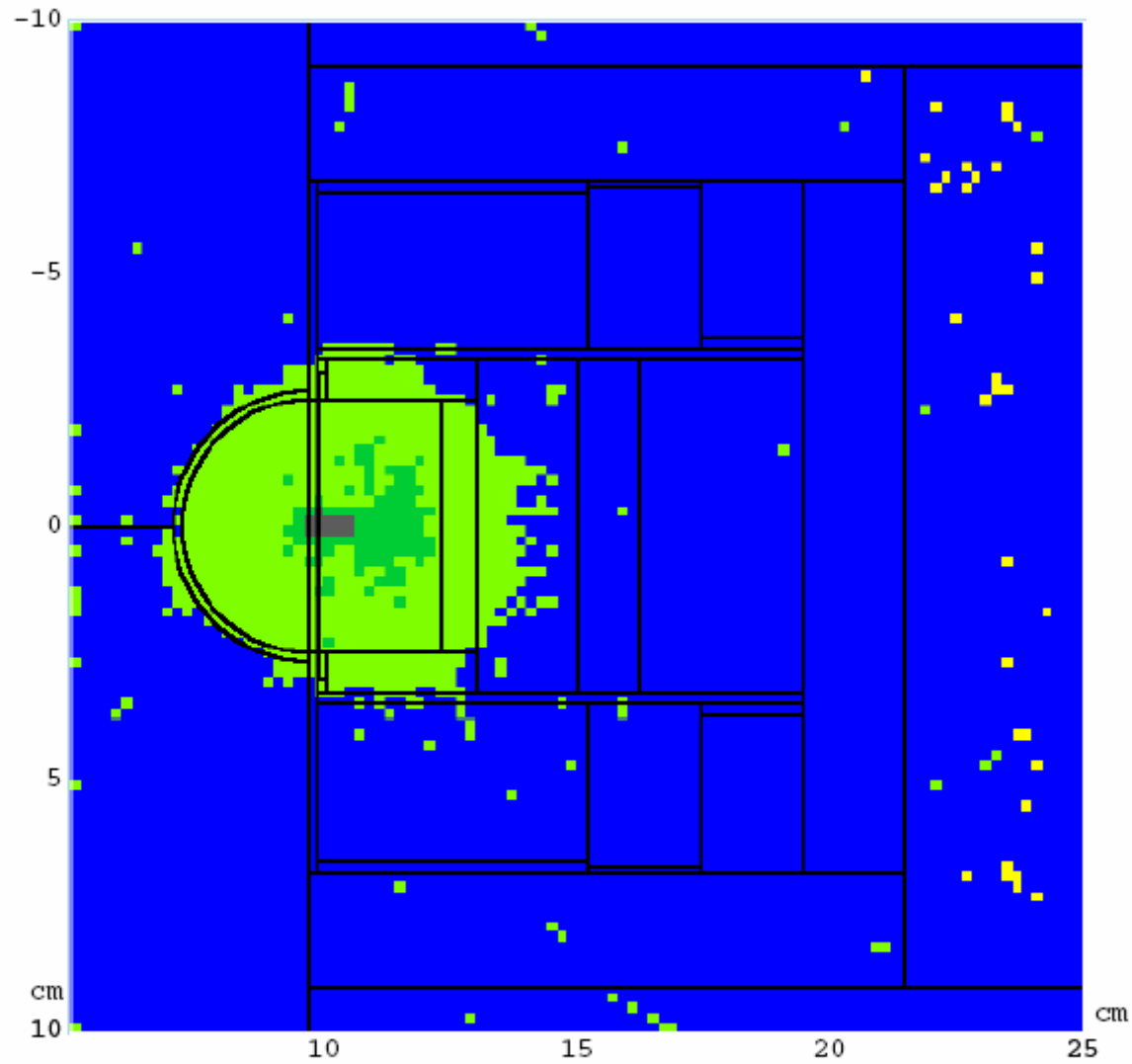


X
Y

Hadron Flux (1/cm2/s) at $10^{34} \text{ cm}^{-2} \text{ s}^{-1}$

MARS14 (2002)

LHC IP5 Roman Pot 4 (horizontal)

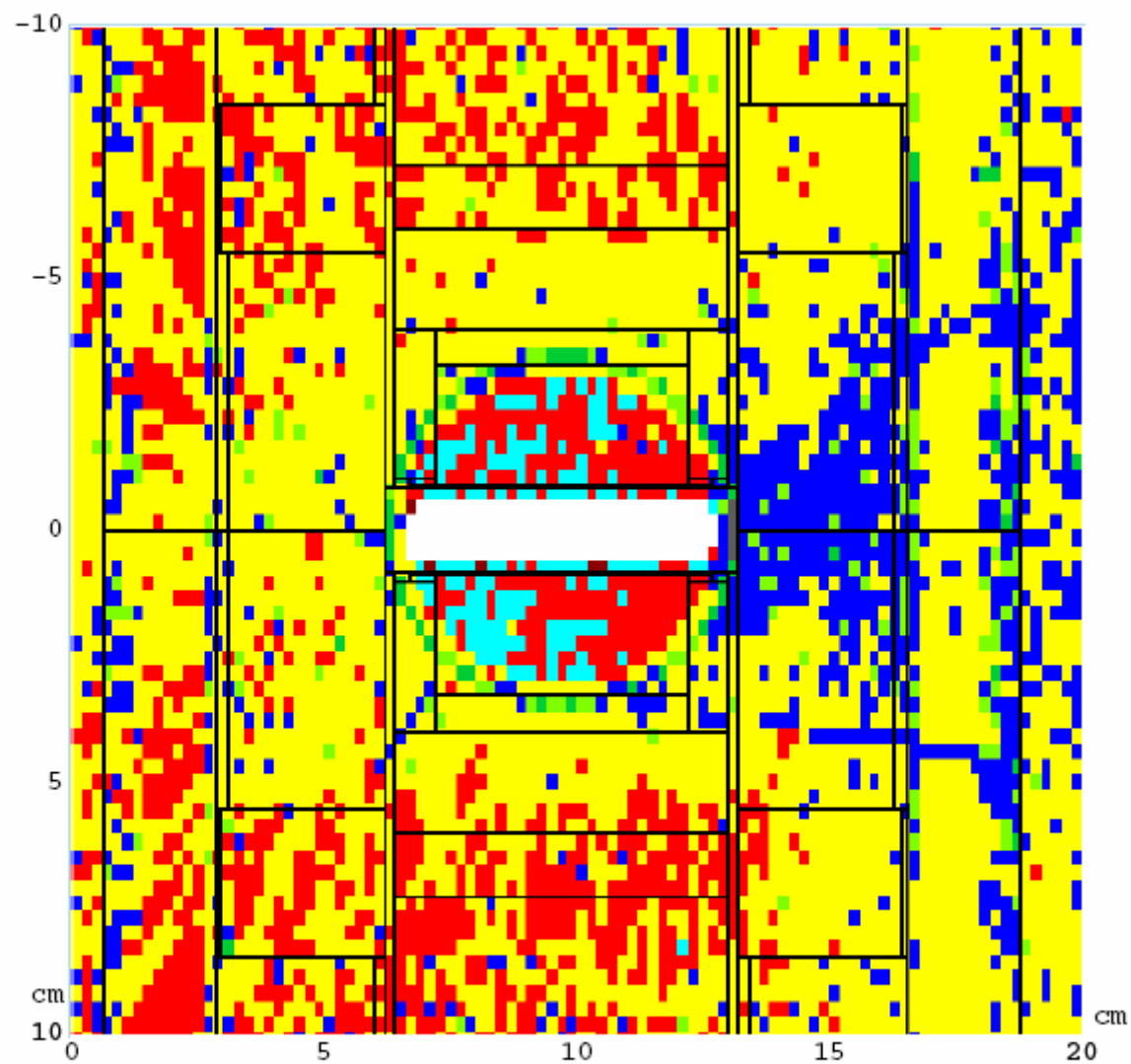


X
Y

Hadron Flux ($1/\text{cm}^2/\text{s}$) at $10^{34} \text{ cm}^{-2} \text{ s}^{-1}$

MARS14 (2002)

LHC IP5 Roman Pot 3

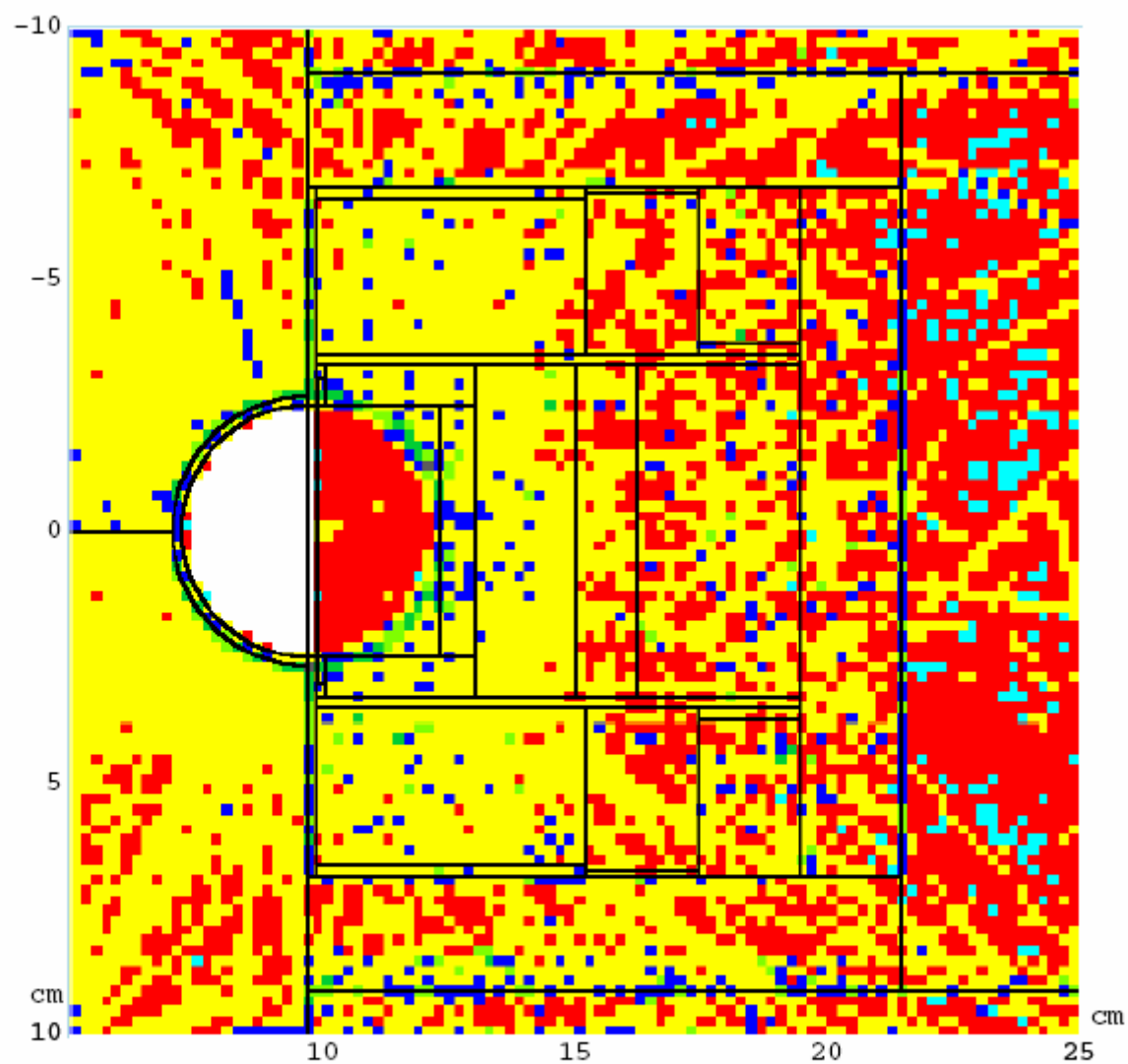


Y
X

Accumulated Dose (Gy/yr) at $10^{34} \text{ cm}^{-2} \text{ s}^{-1}$

MARS14 (2002)

LHC IP5 Roman Pot 4 (horizontal)



X
Y

Accumulated Dose (Gy/yr) at $10^{34} \text{ cm}^{-2} \text{ s}^{-1}$

