

Radiological studies during the conditioning of the RF cavity for the ALBA Storage Ring

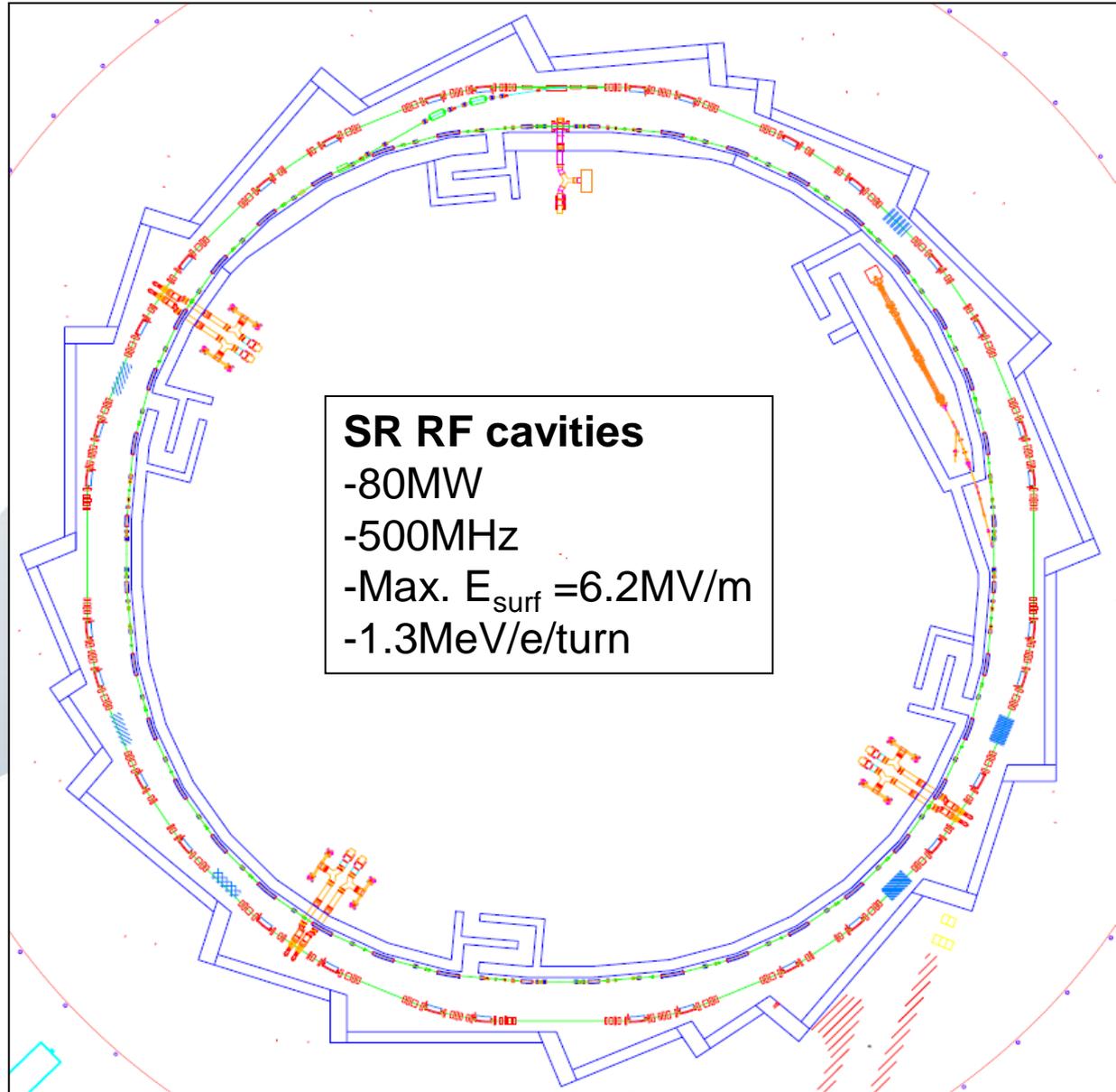
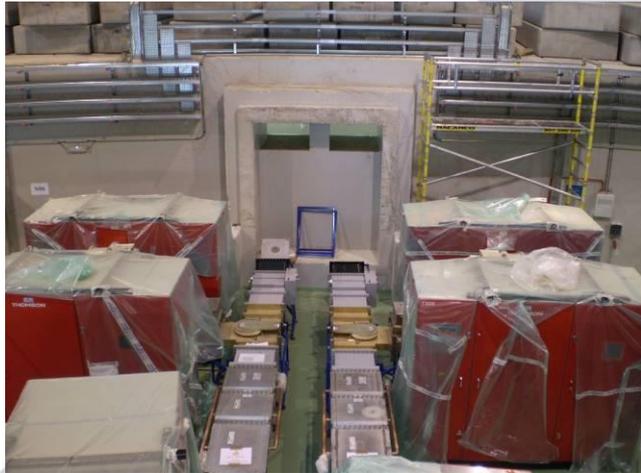
F.Fernandez and X.Queralt

- Intro
 - The RF cavities
 - The RF bunker
 - The PSS
 - The Detection systems
- Measurements
 - With/without reinforcement
 - On surface
 - Online acquisition
 - Spectrum
- Simulations



1 RF BOOSTER cavity

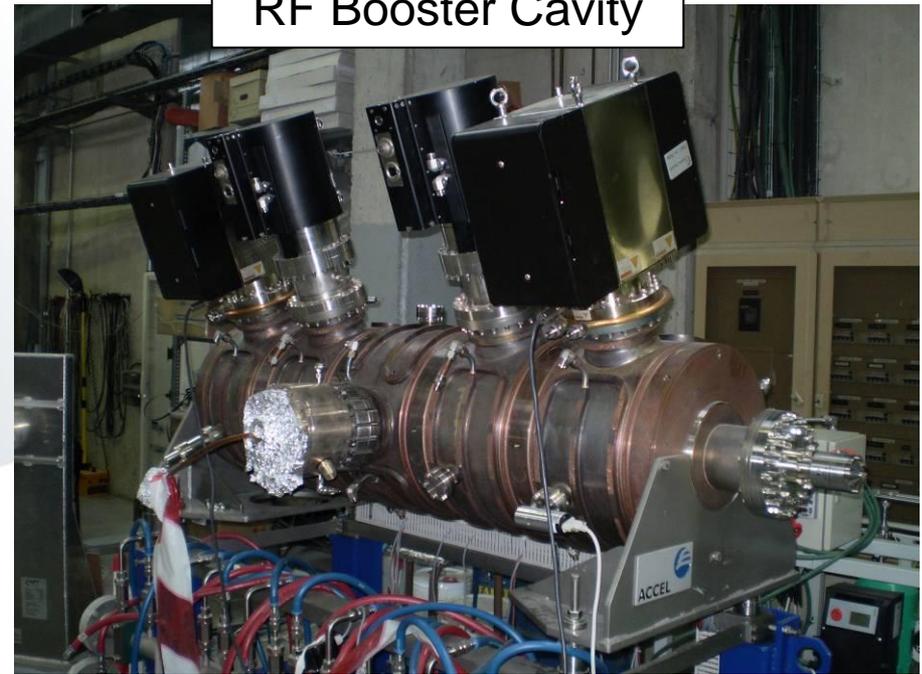
6 RF SR cavity (12 IOT)

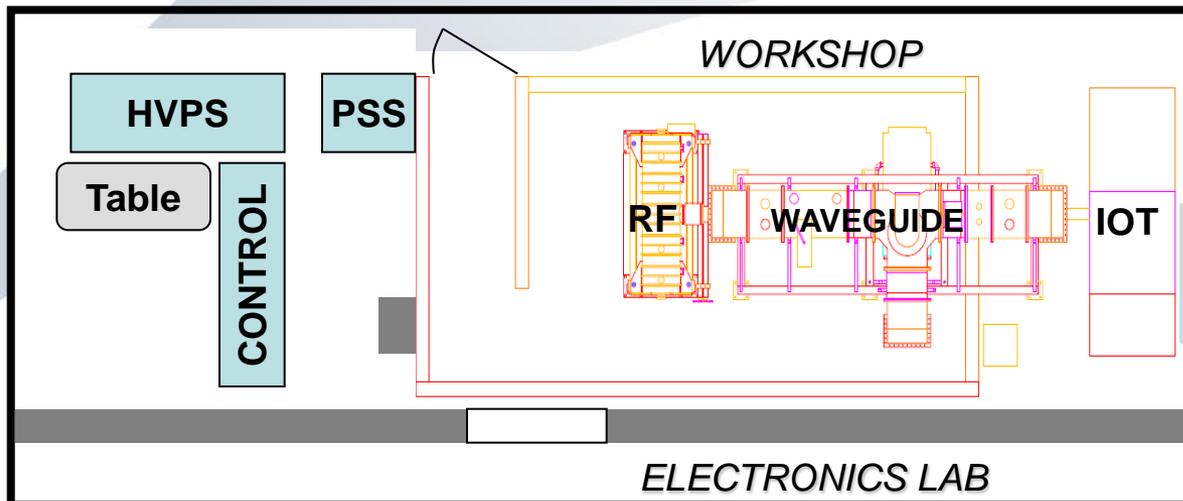


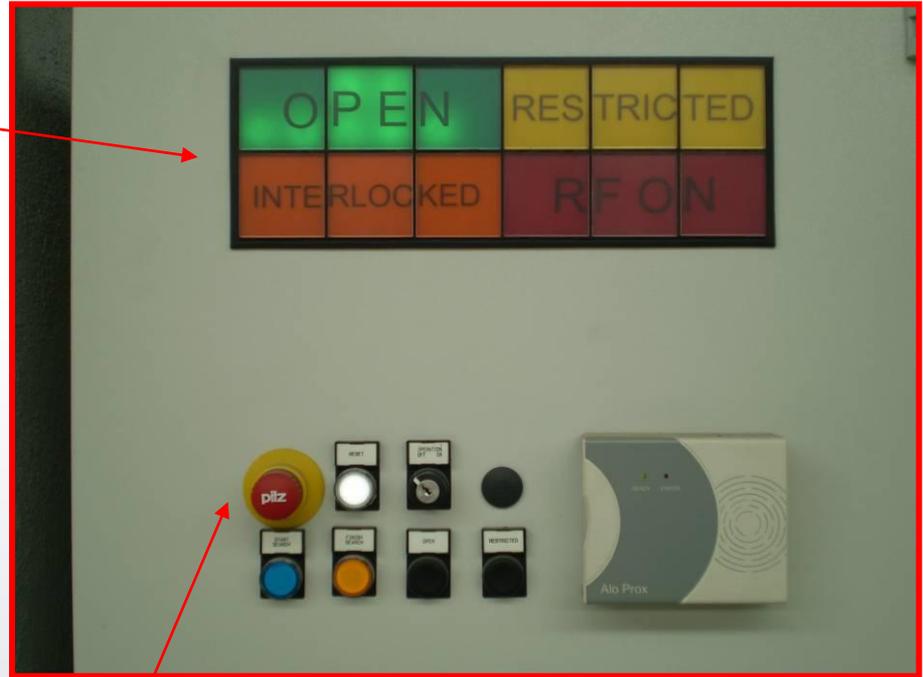
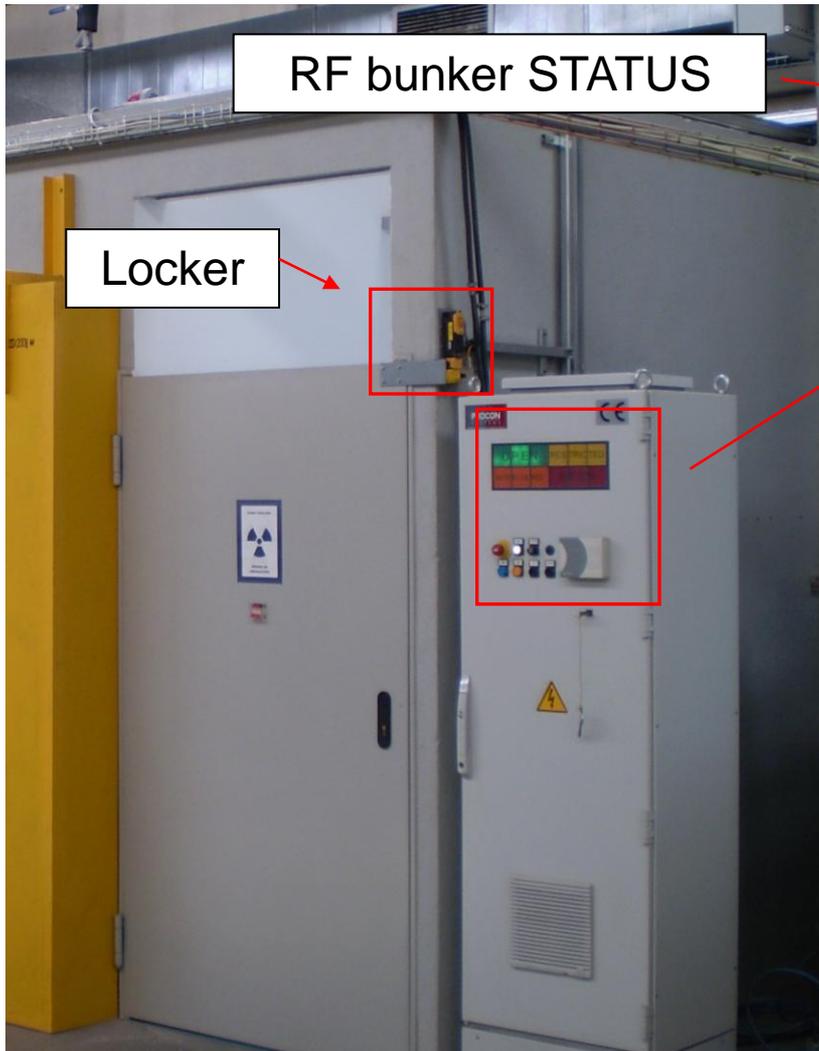
RF Storage Ring Cavity



RF Booster Cavity

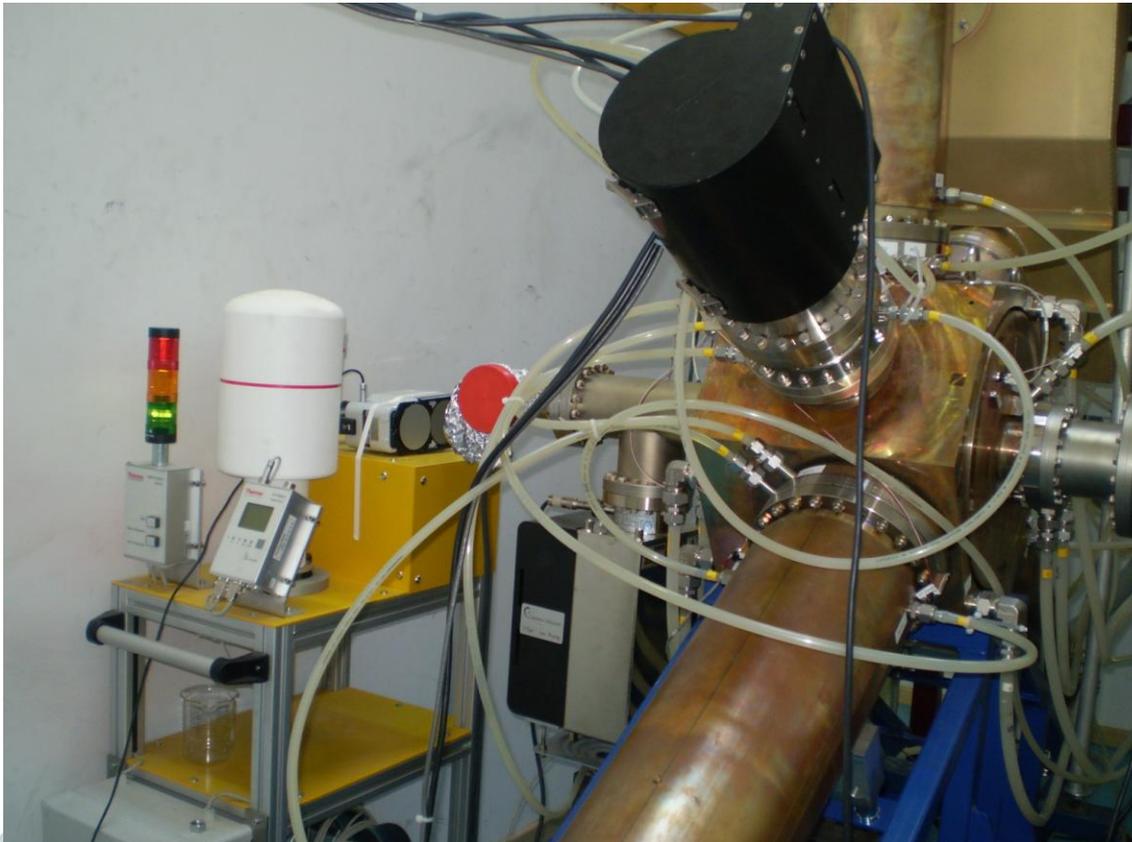




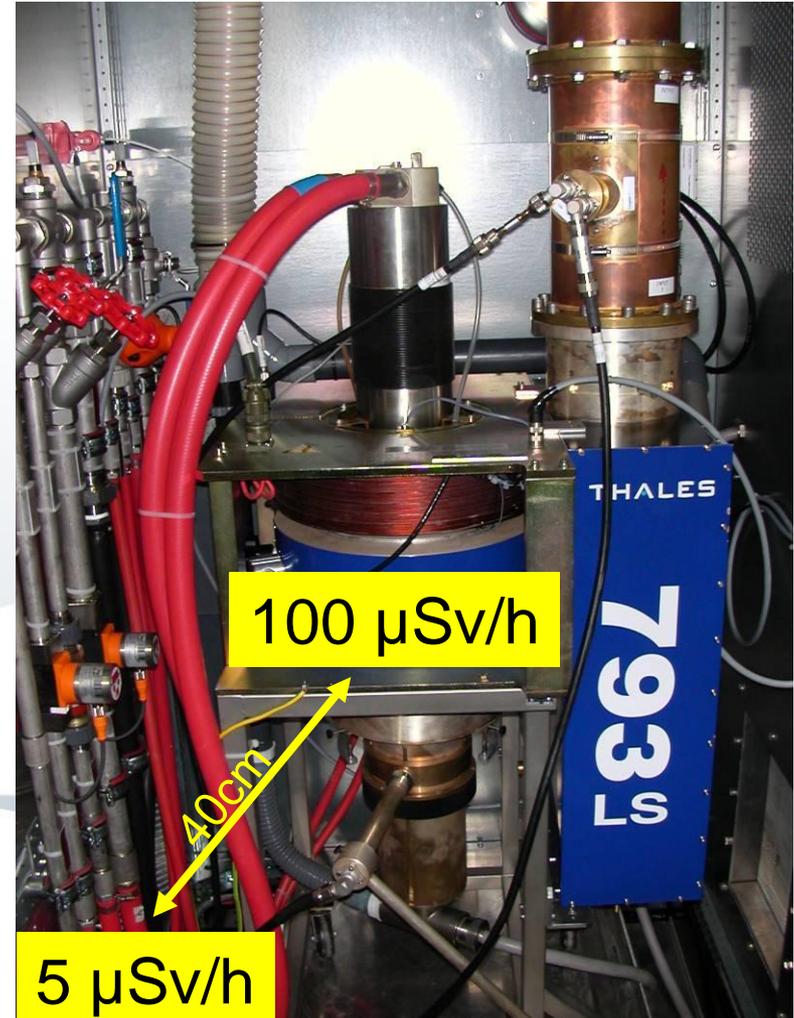


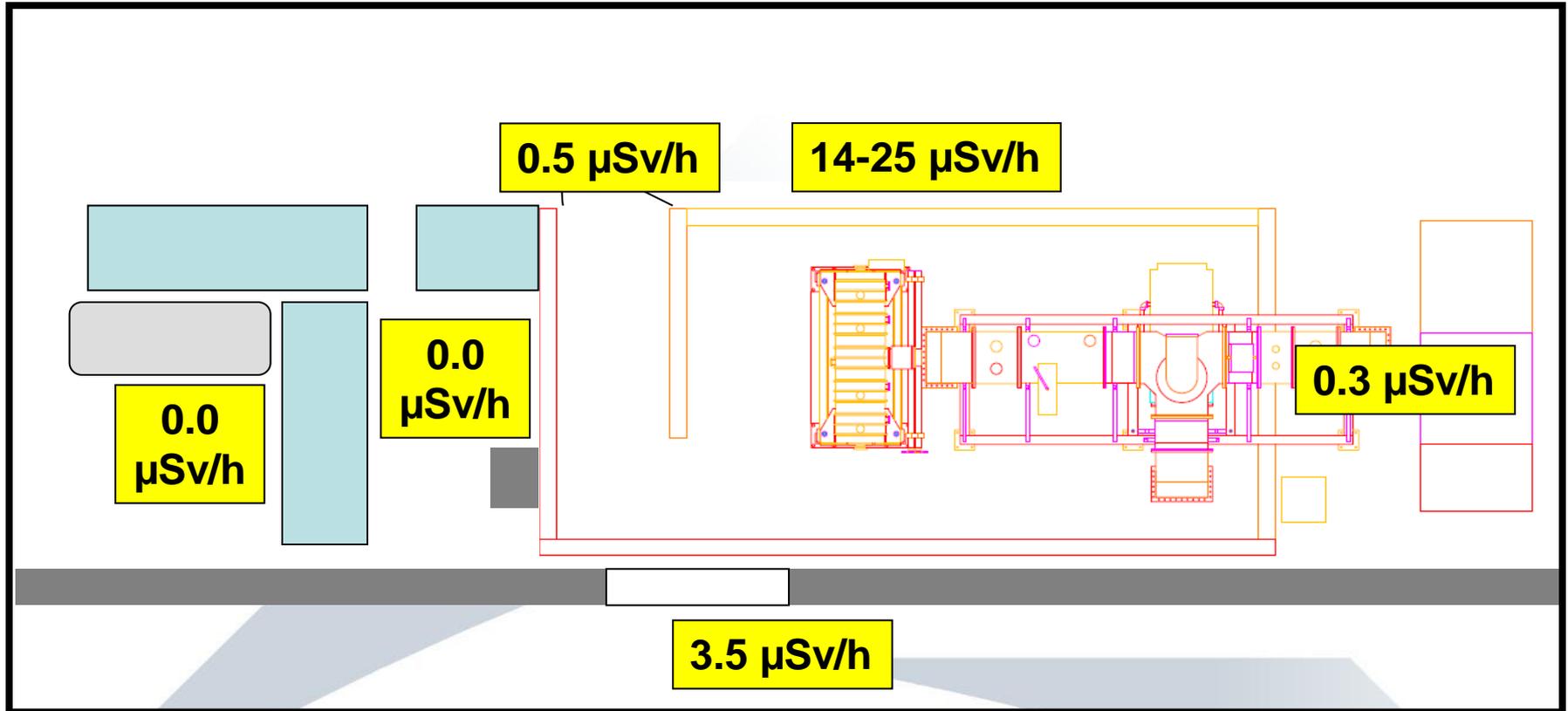
Emergency Button

- PORTABLE DETECTORS (IN & OUT)
- DOSIMETERS (IN & OUT)
- SPECTROMETER (“IN”)
- ONLINE MONITORING (IN)



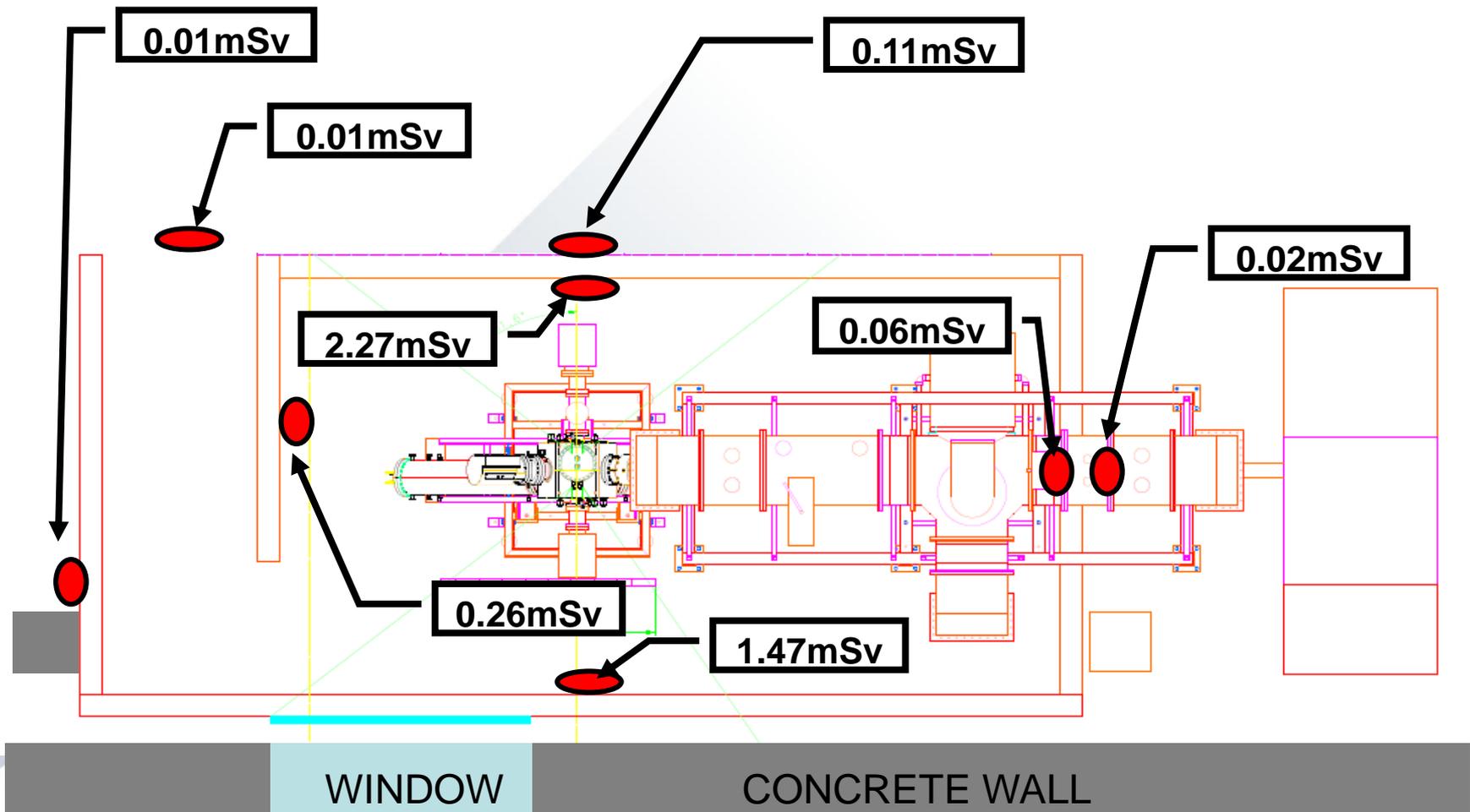
COMPANY	MODEL	ENERGY RANGE	DETECTION RANGE
THERMO	SmartION Mini 2100S	>10keV	0-500mSv/h
FLUKE	Victoreen 451P	>25keV	<50mSv/h
THERMO	FH40 G-L10	>30keV	10nSv/h - 100mSv/h
THERMO	FHZ 672 E-10:	48 keV - 4.4 MeV	1nSv/h - 100mSv/h
THERMO	RadEye PRD	30 keV – 1.3 MeV	0.01 μ Sv/h – 250 μ Sv/h

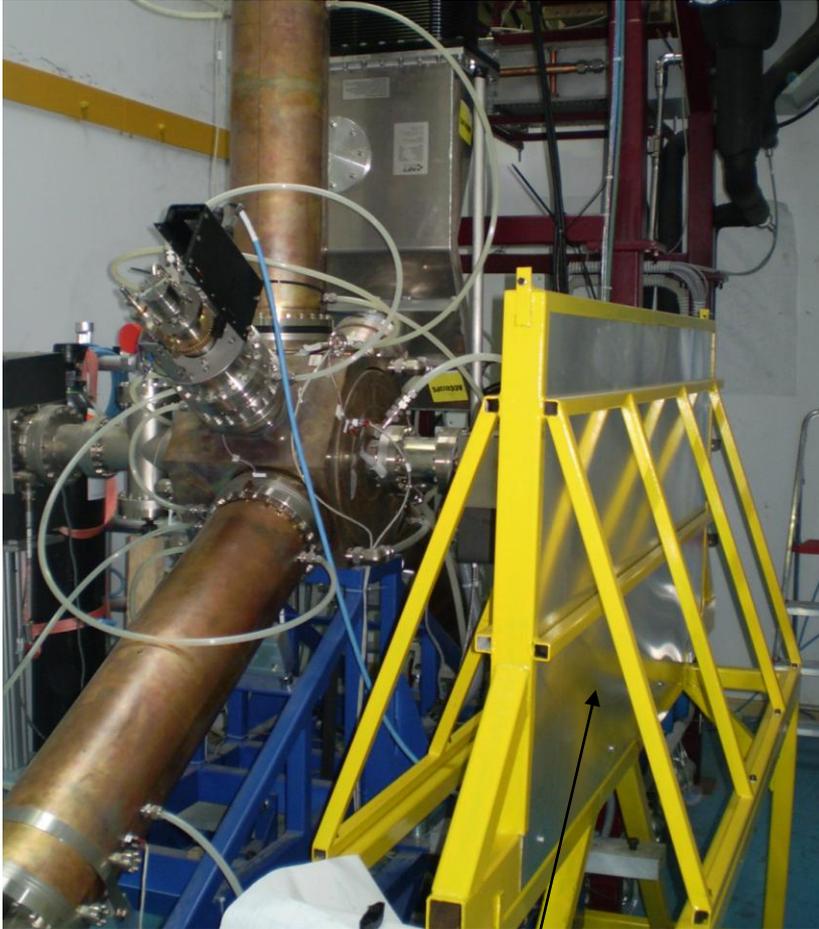




80kW (max power) @ 20%

ACCUMULATED GAMMA DOSE IN ONE MONTH: ~10 working hours
80kW (max power) @ 20%

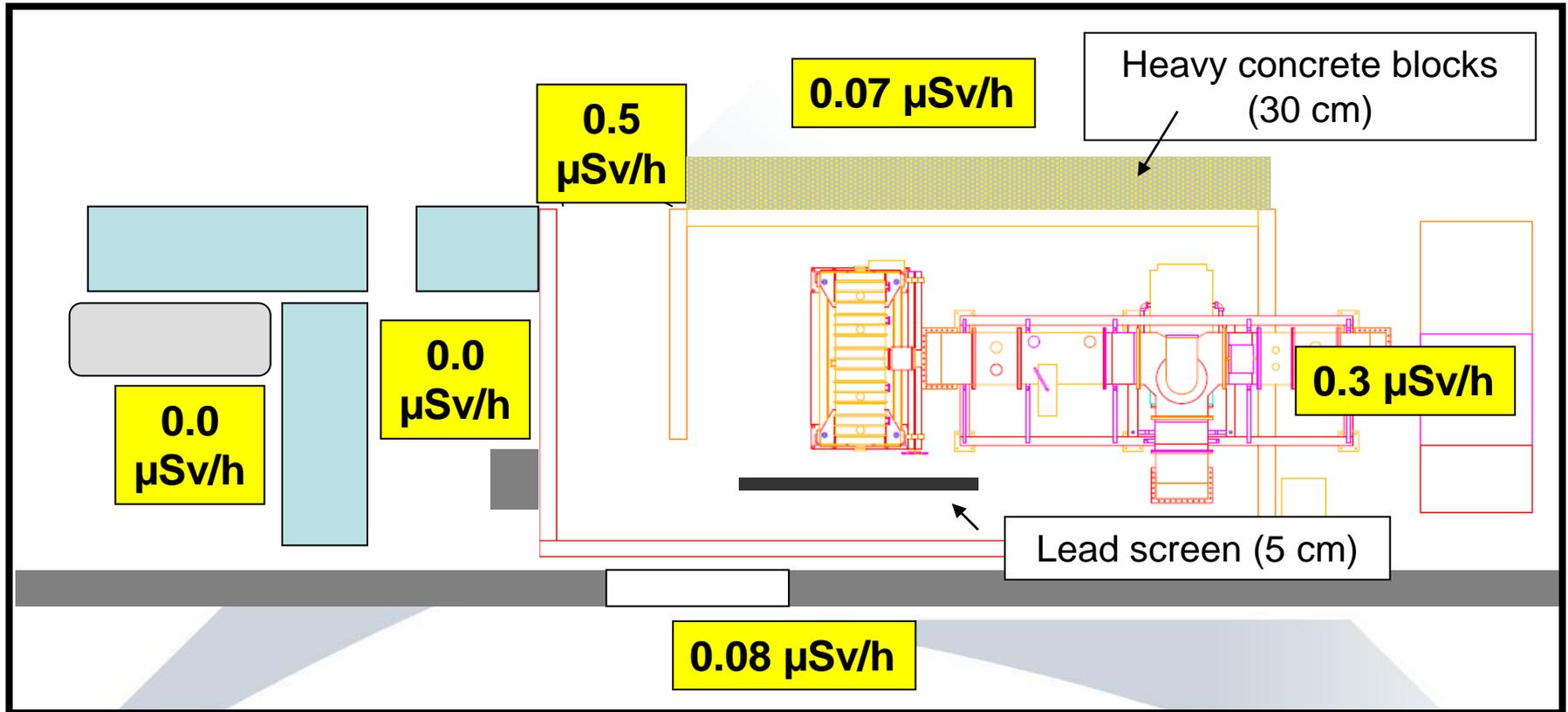




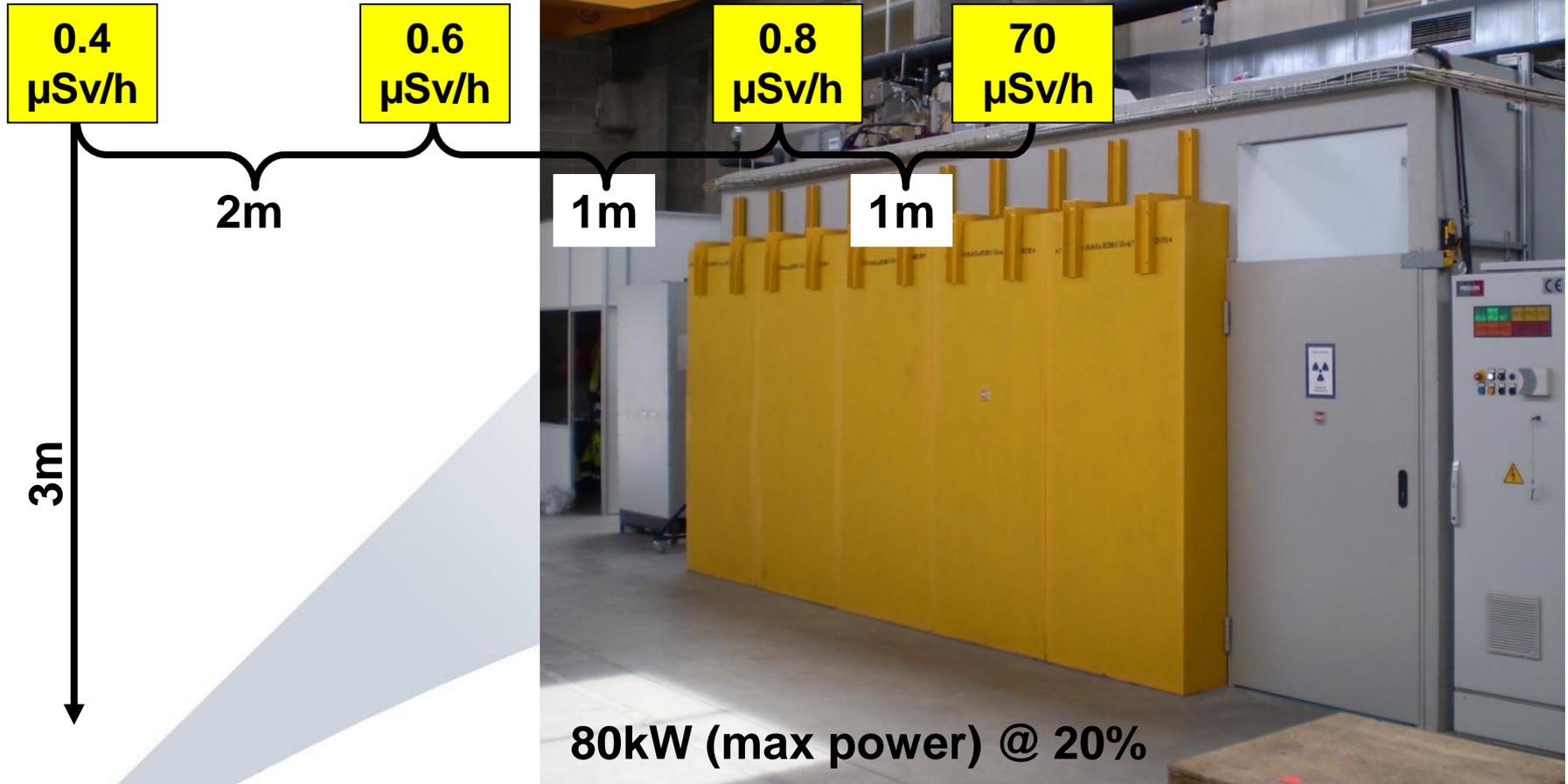
Lead screen (5 cm)



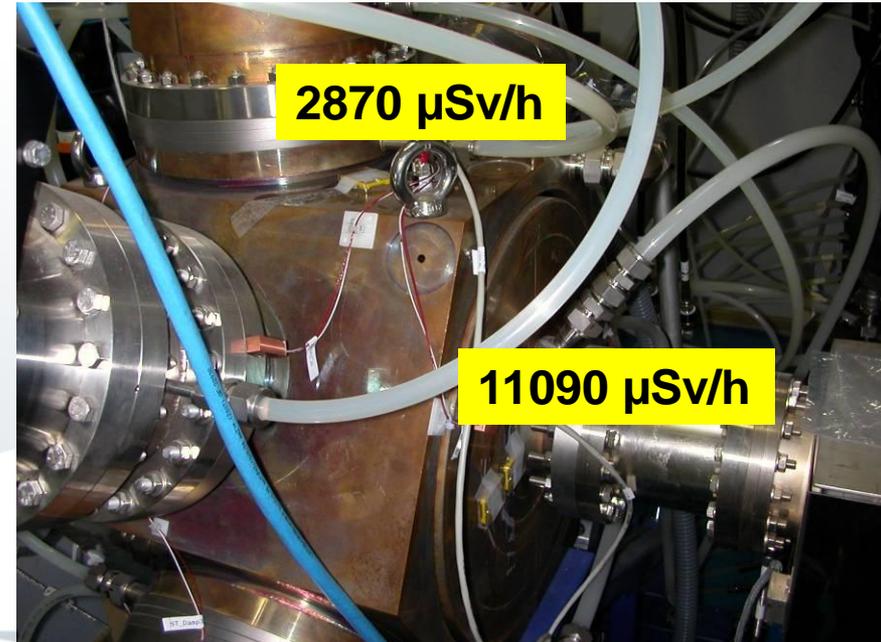
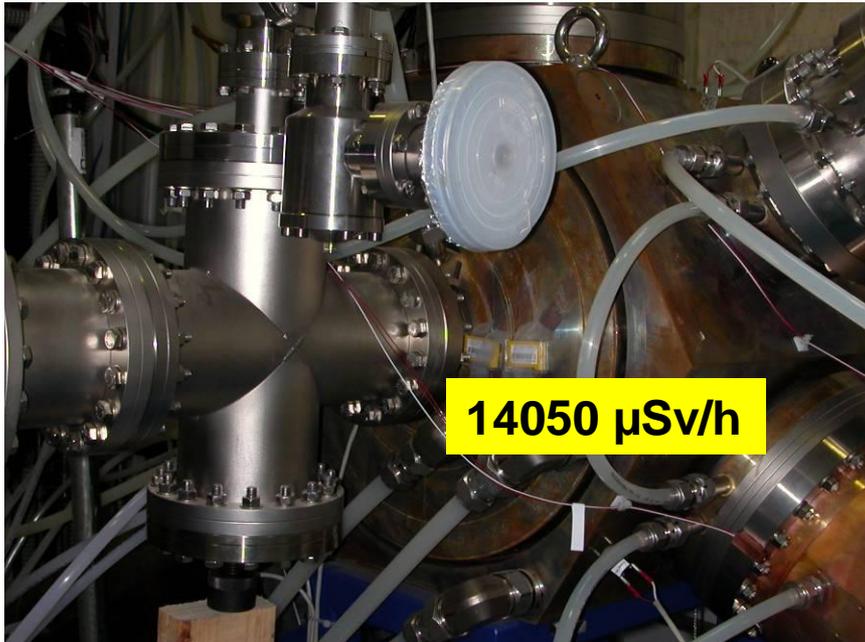
Heavy concrete blocks (30 cm)



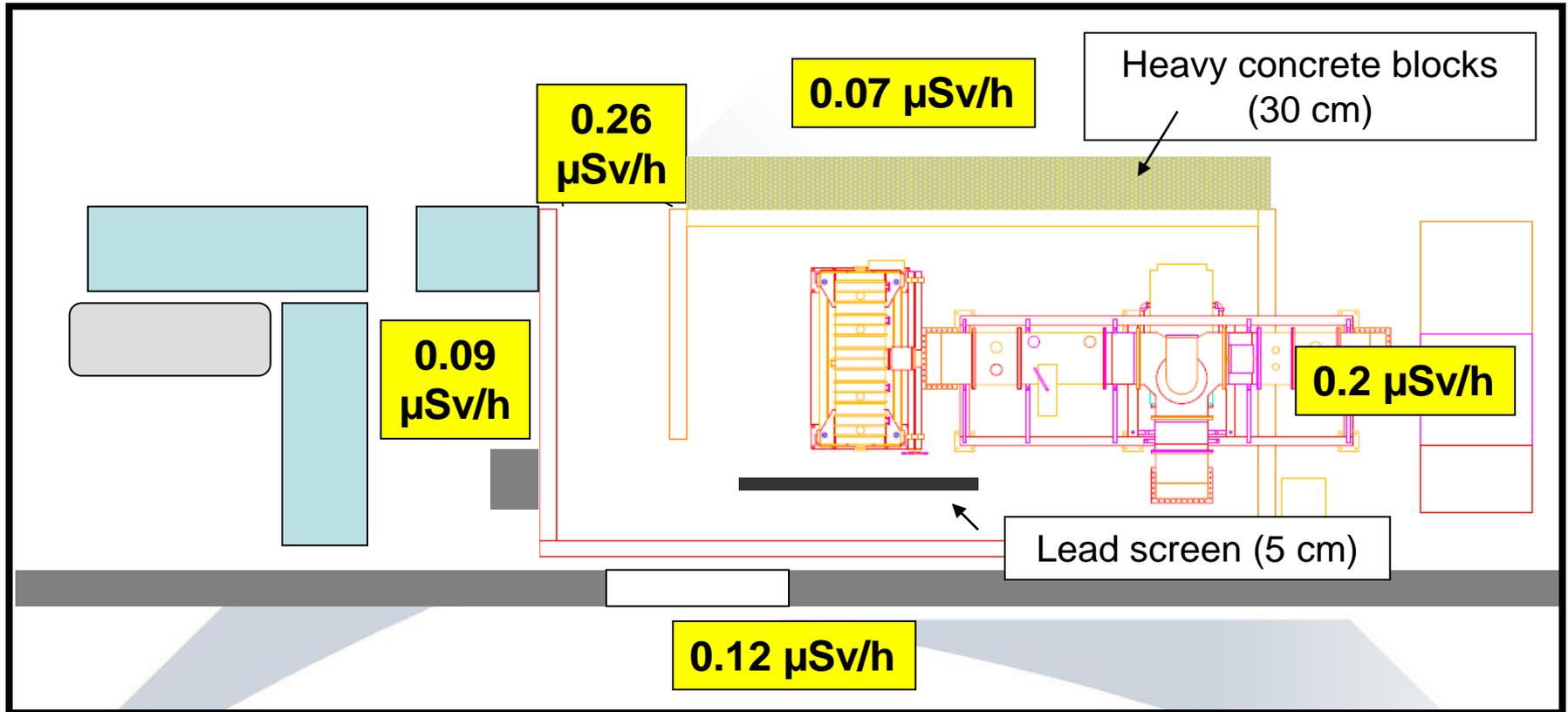
80kW (max power) @ 20%



WORK PERMITS FOR WORK ABOVE 2.5 m ARE REQUIRED - ADMINISTRATIVE CONTROL

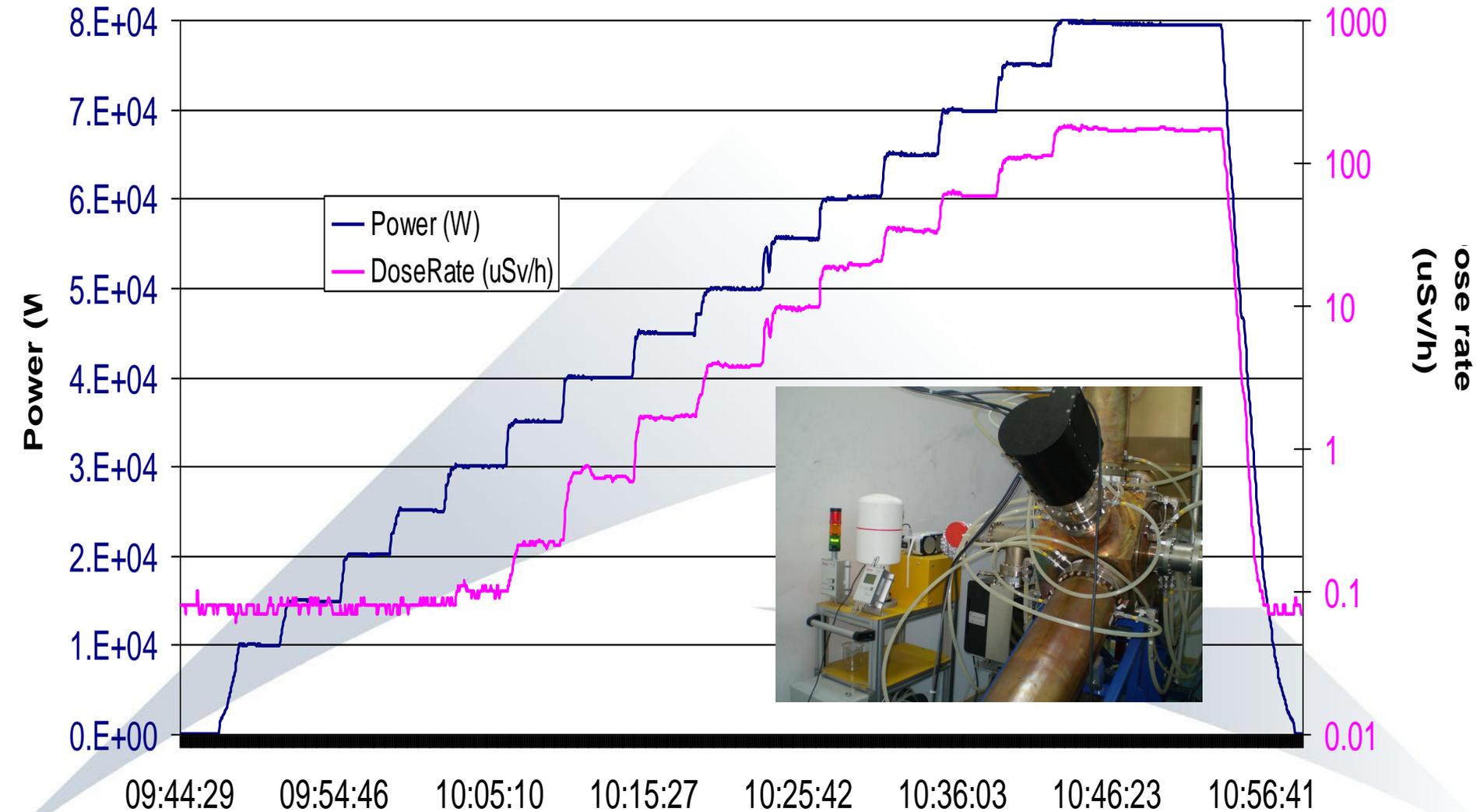


80kW (max power) @ 20%

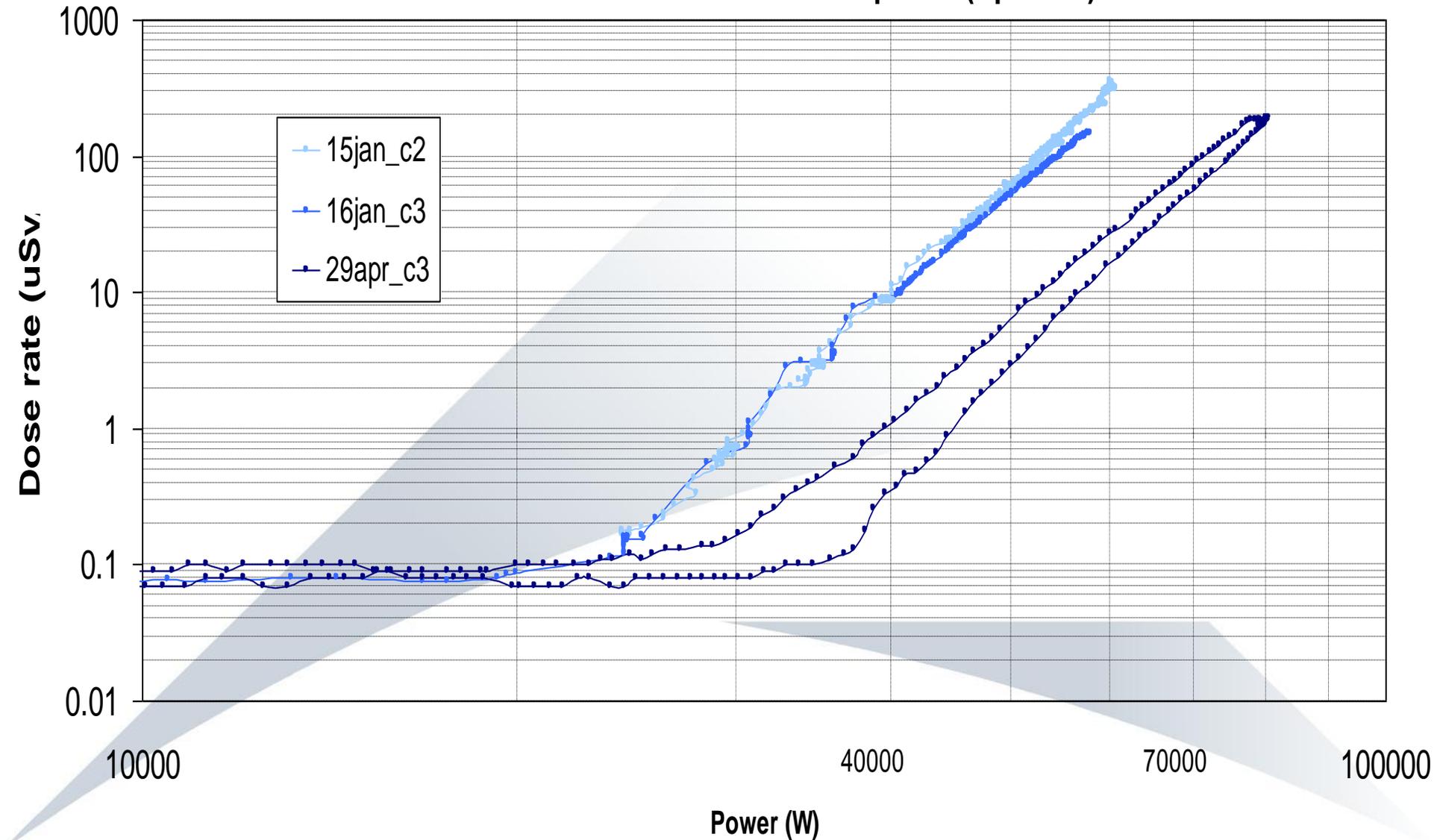


80kW (max power) @ 100%

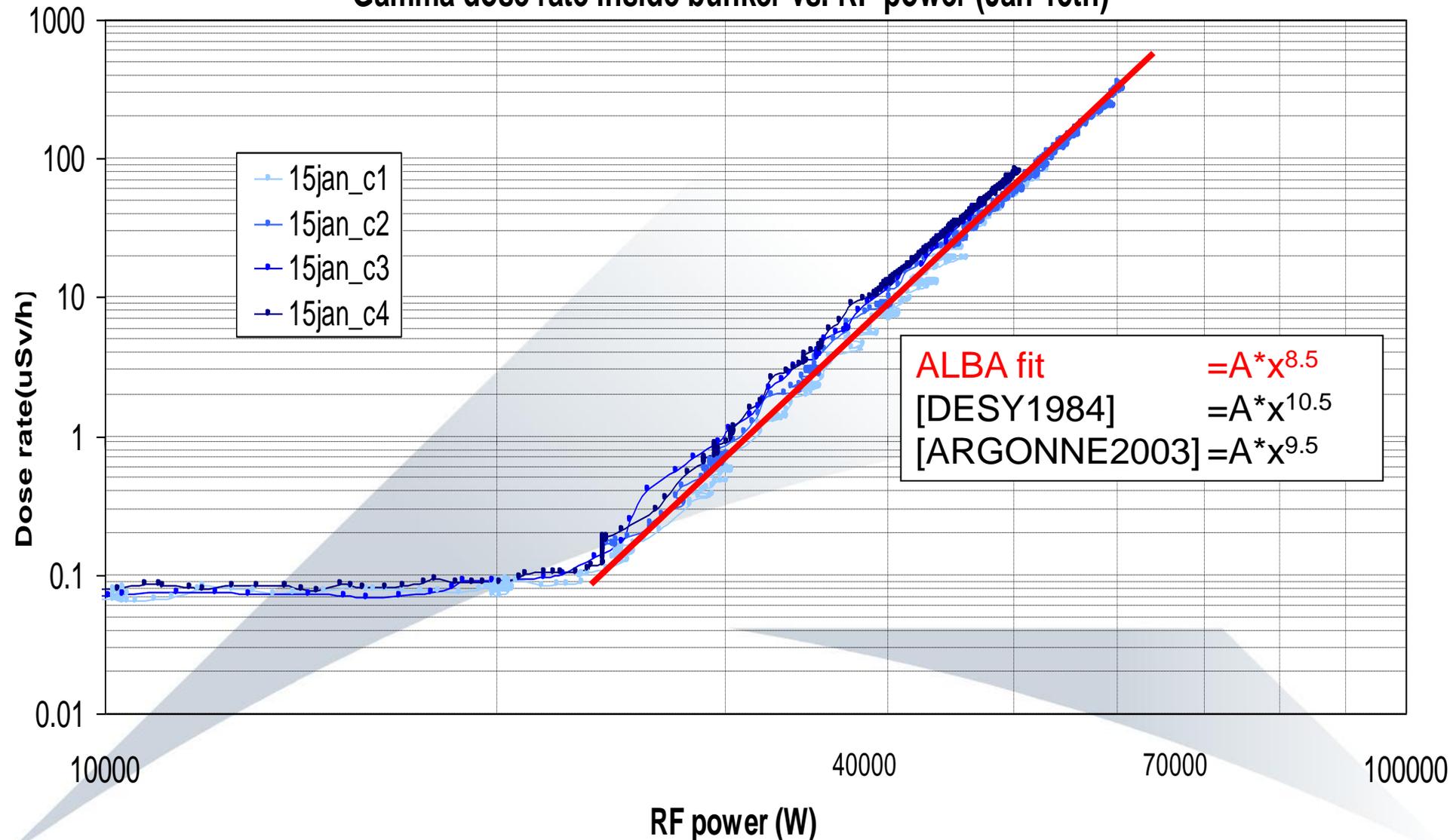
Power and gamma dose rate vs. time



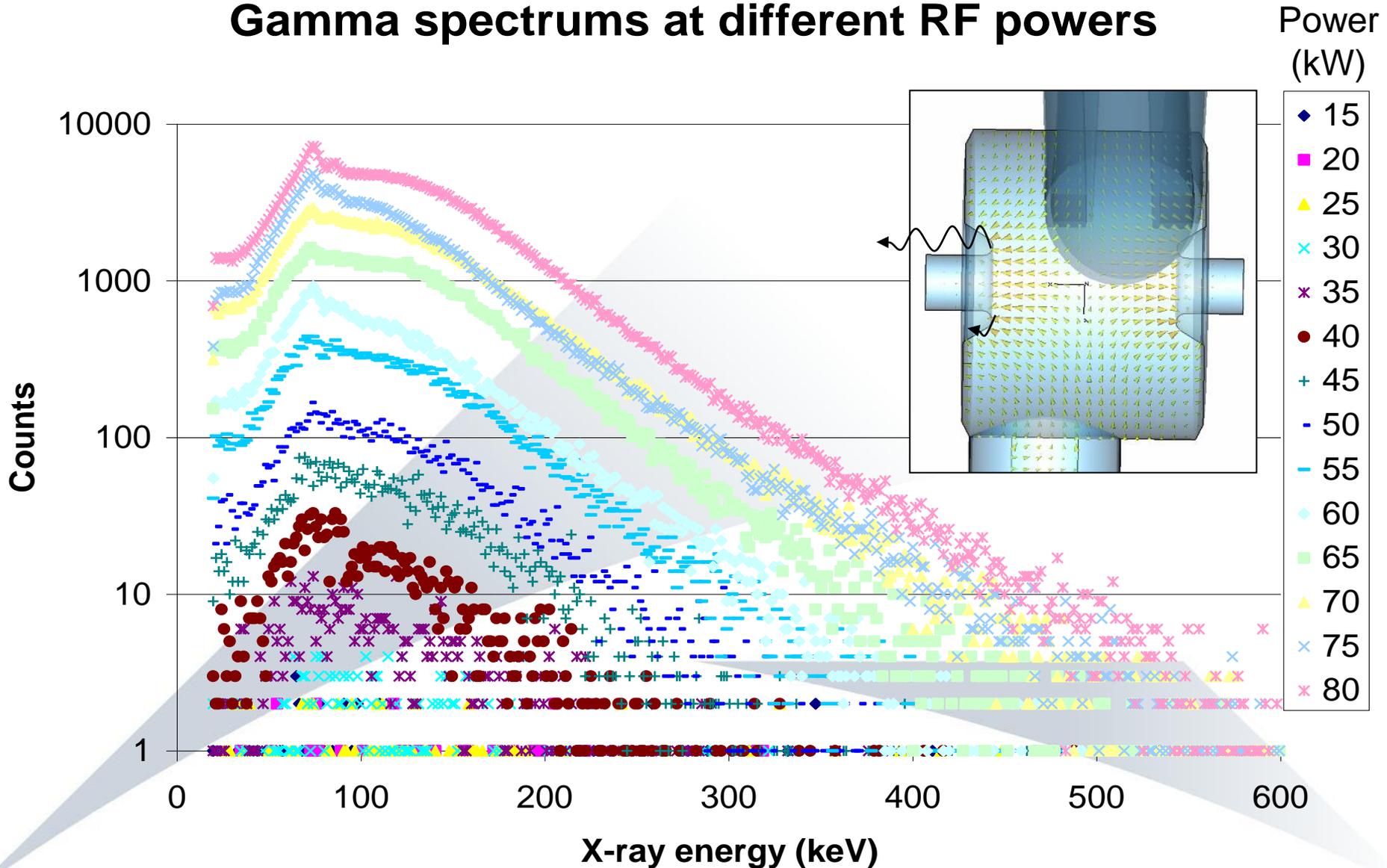
Gamma dose rate inside bunker vs. RF power (Apr 29th)



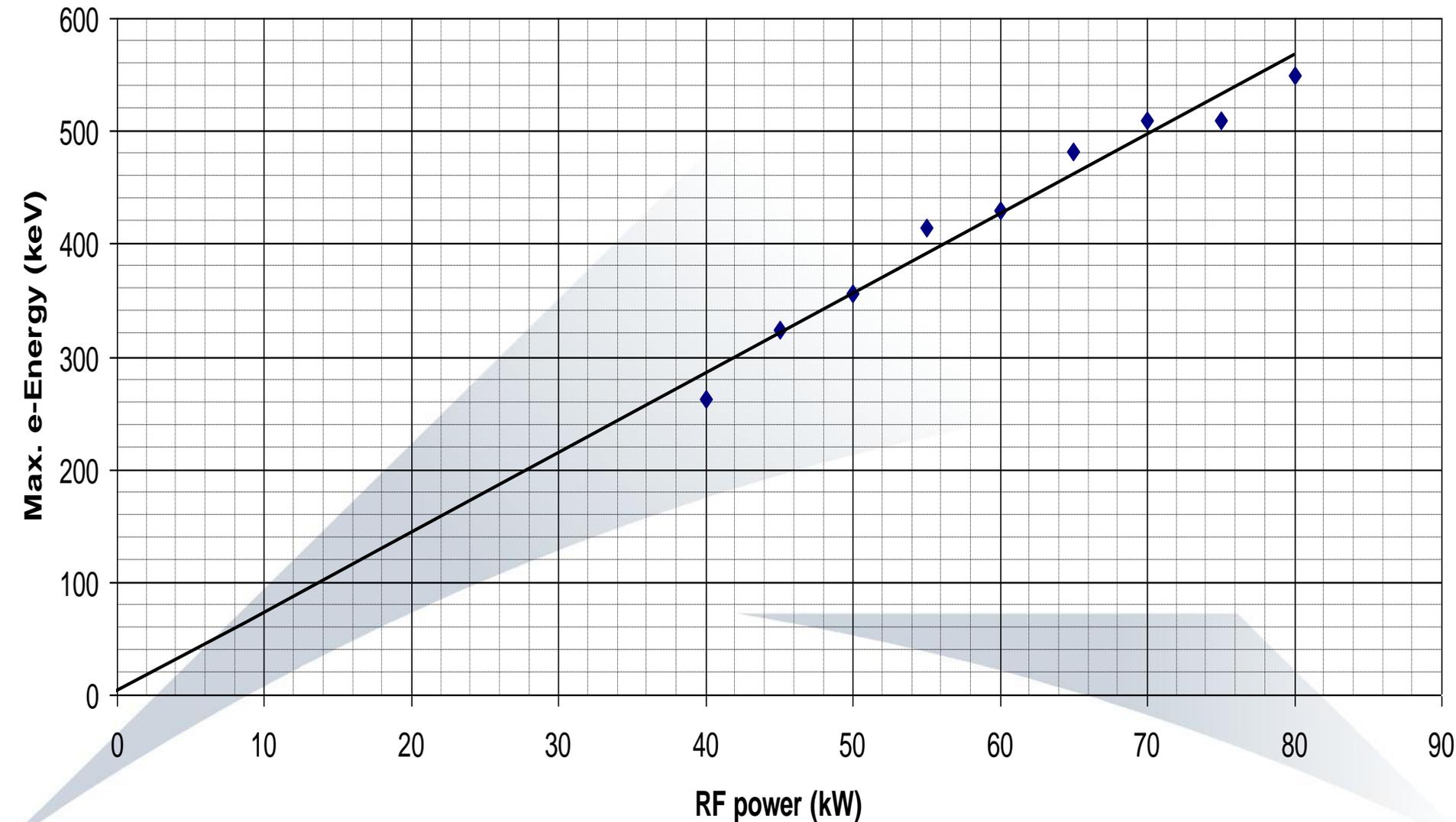
Gamma dose rate inside bunker vs. RF power (Jan 15th)

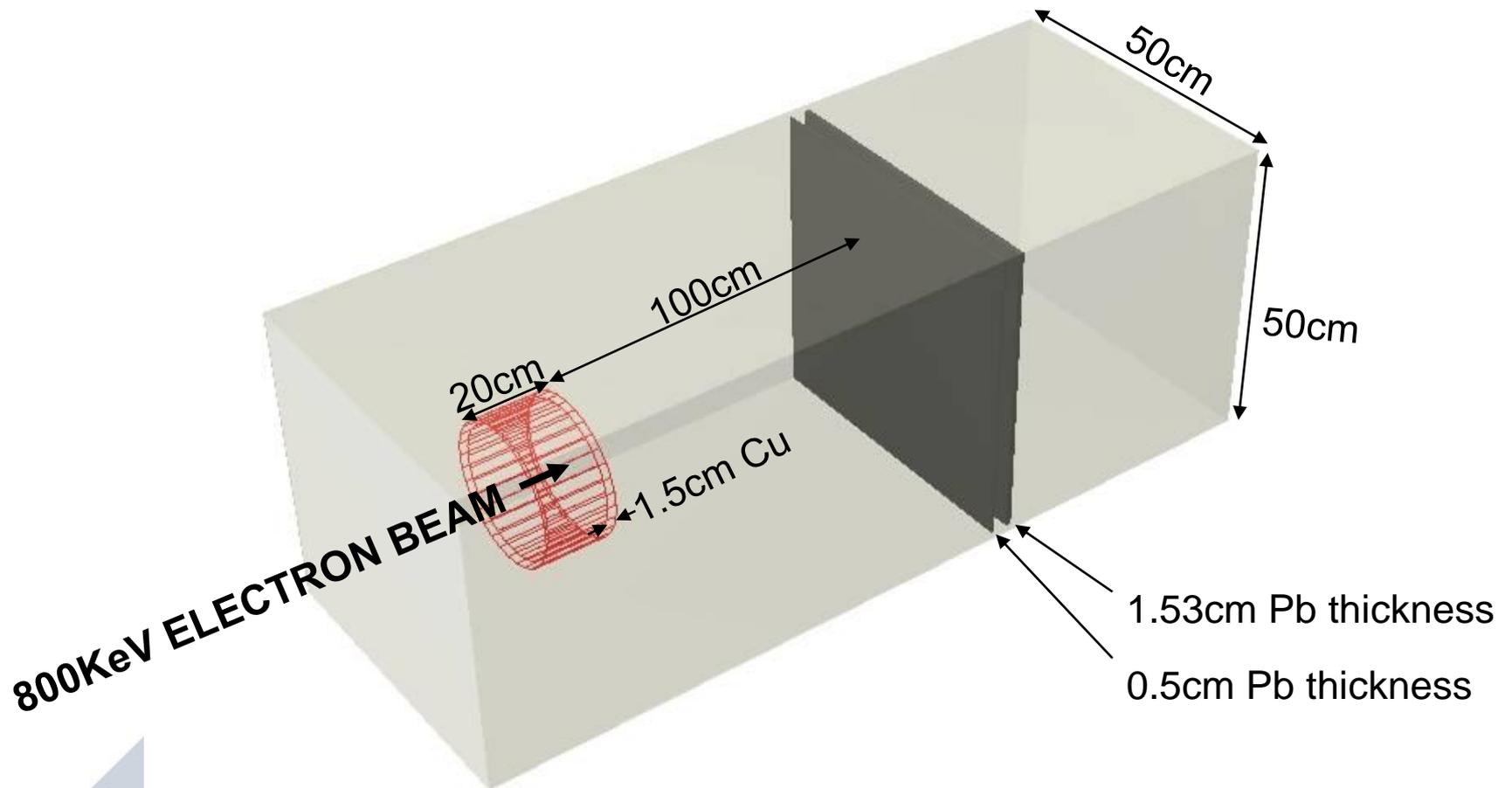


Gamma spectrums at different RF powers

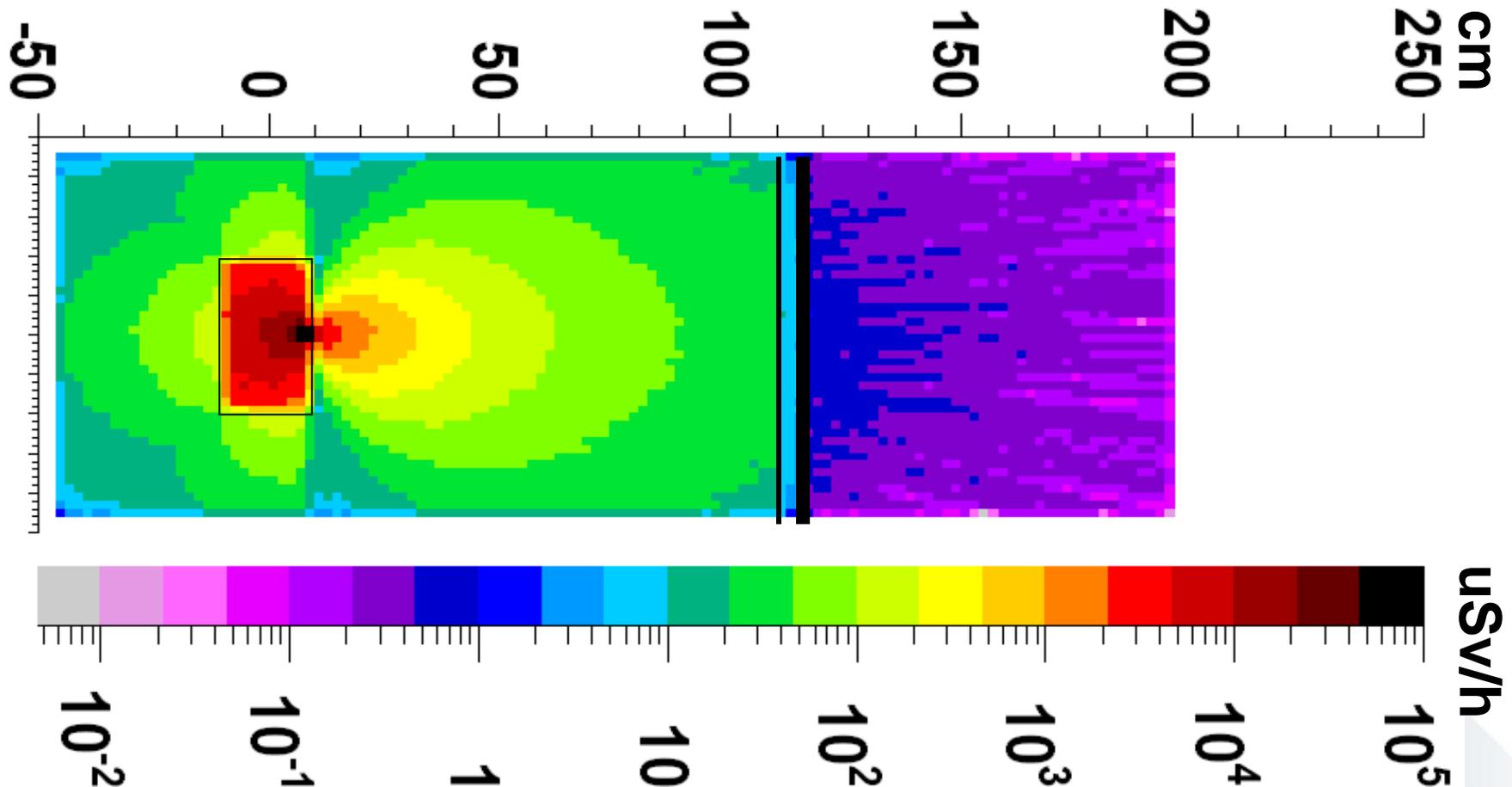


Maximum e-Energy vs. RF power





SIMULATED EFFECTIVE DOSE RATE DISTRIBUTION: The electron current is normalized ($2.8 \cdot 10^{10}$ electrons/s // 2.5nA) to have 8uSv/h after the first layer (0.5cm of lead).



THANK YOU FOR YOUR ATTENTION