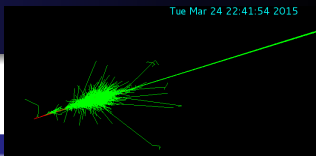


CPS Radiation Simulation Update

Gabriel Niculescu
James Madison University

CPS Meeting 03/27/2020

March 27, 2020



...

- ...lots of things (not CPS related) happened...
Hope you are all safe and healthy!
- still not solid #s for “target” prompt/activation levels.
- side-by-side comparisons of some possible CPS geometries
- (based on suggestions/analysis by RE & BW)
- RE: focus on particular configs.
- BW: look for rad. level at particular locations.

Disclaimer

- ...as usual!



Jefferson Lab

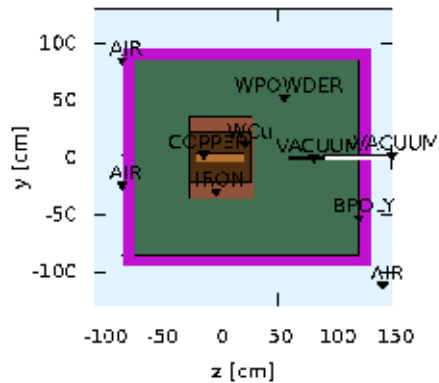


A bit of bookkeeping

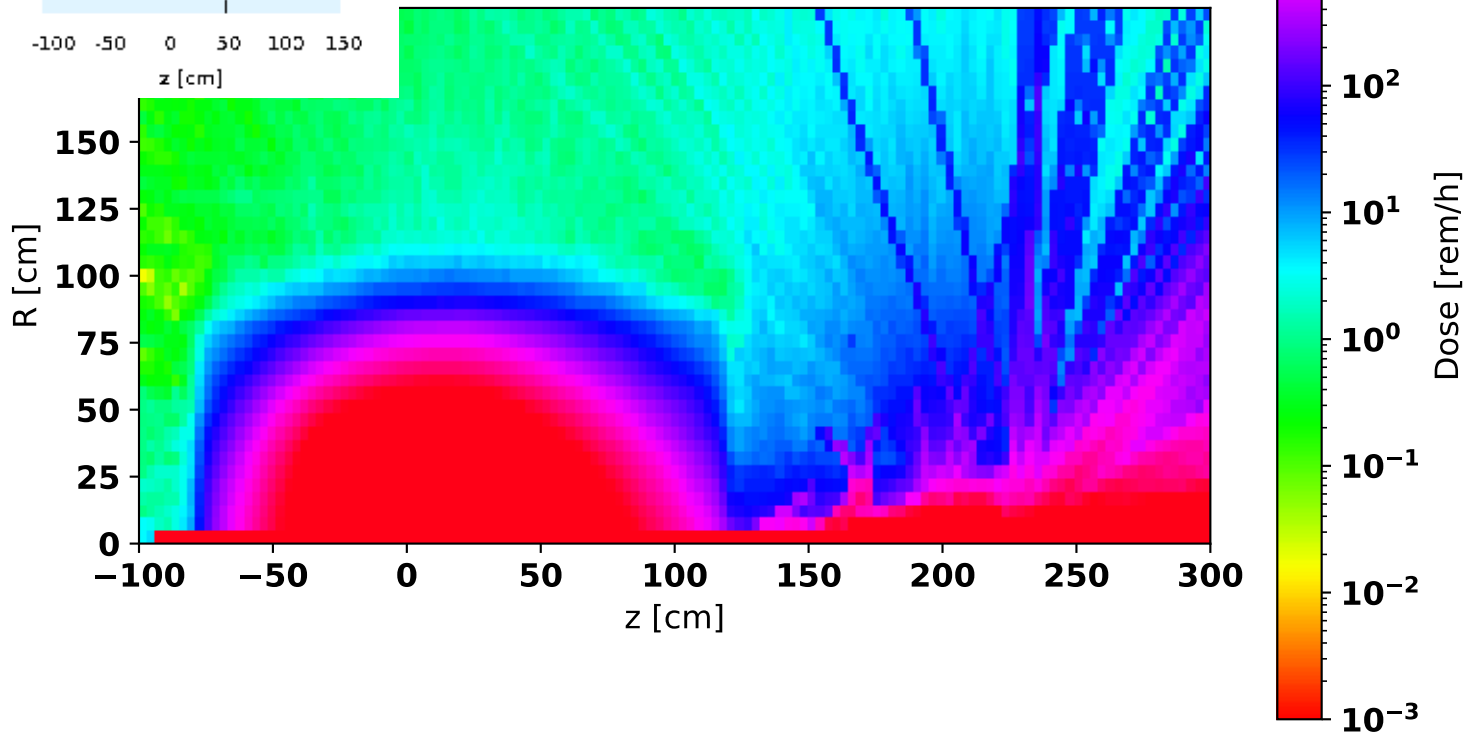
CPS 2.1

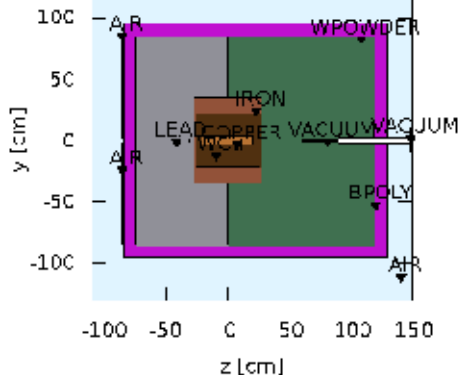
- On hand: ~ 12 configurations (geom, mat, ordering, ...)
- growing exp. modifying/producing new config.
(~ 1 h or so depending how complex the new design is)
- Double checked W/Pb/plastic/Pb_skin volumes (IN)
- ~ 1 day to get baseline statistics. 2-3 days for better precision.
- that said, we really need those target #s, I think.
- the rest of this (other than the last slide) is a show-and-tell.

Config	W [m^3]	Pb [m^3]	Plastic [m^3]	Pb_skin [m^3]
001	5.4	0.0	2.1	1.2
W/Pb z=0	3.3	2.0	2.1	1.2
Doll 10/40	0.6	1.6	0.9	1.1
Mk III	1.1	1.1	0.9	1.1

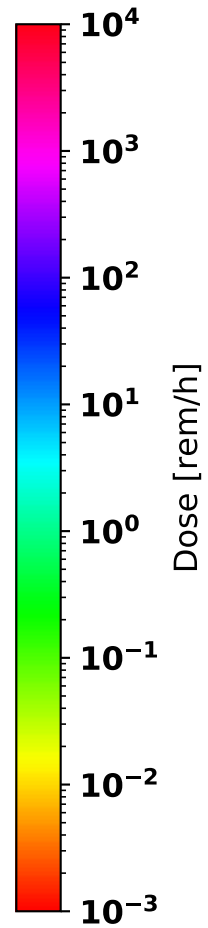
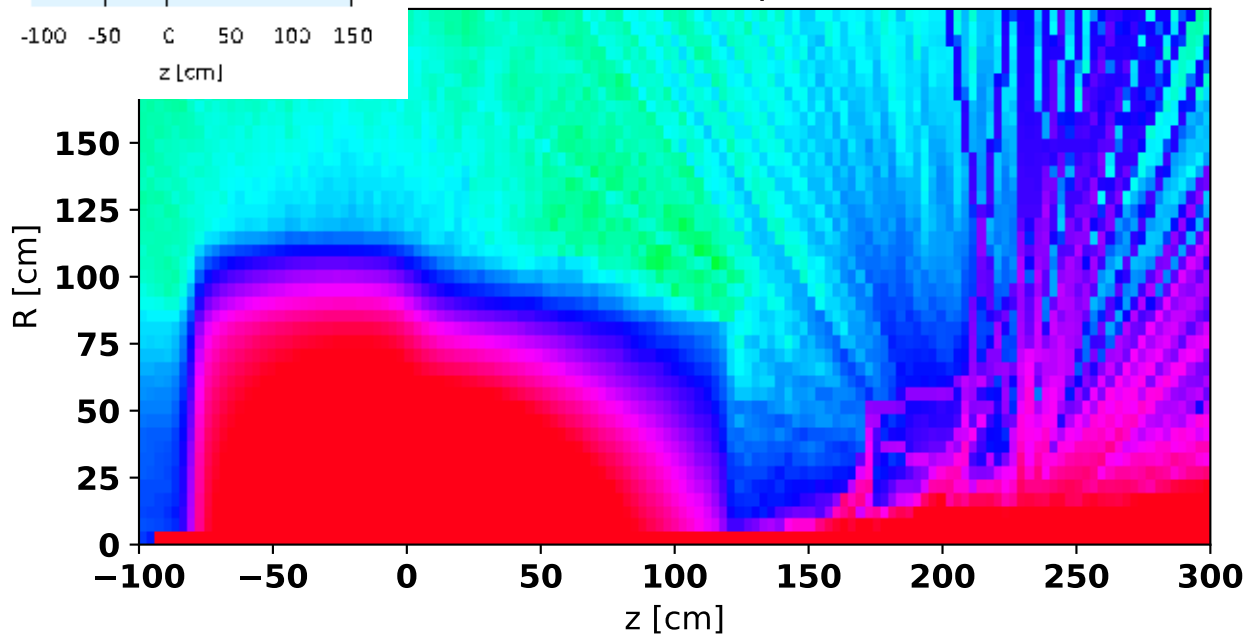


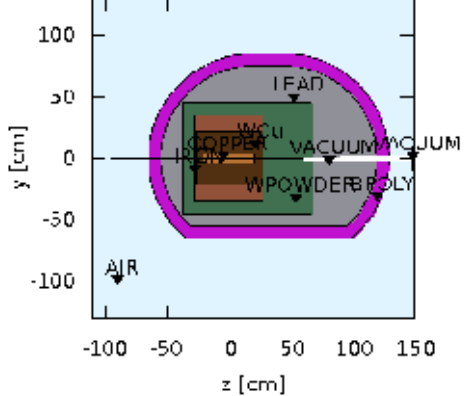
001: Prompt Dose



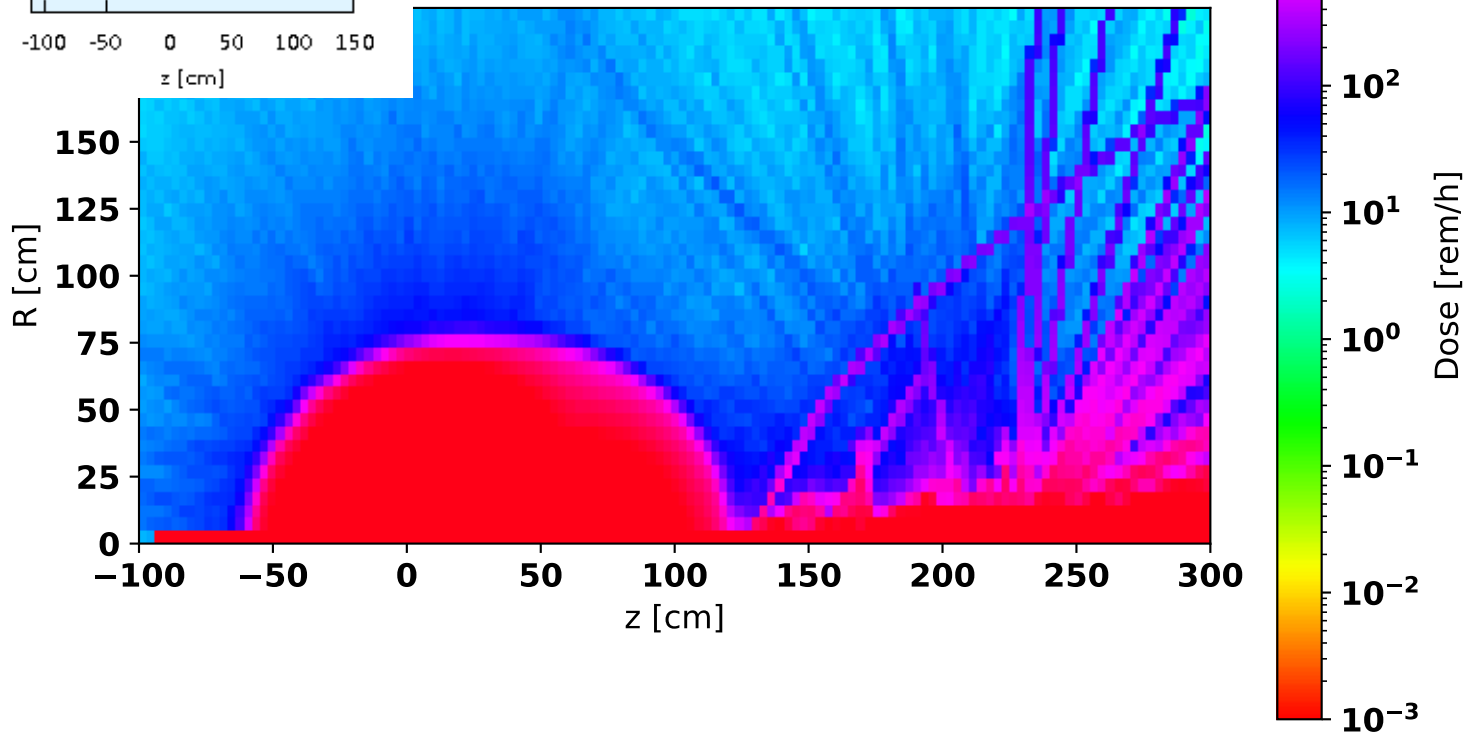


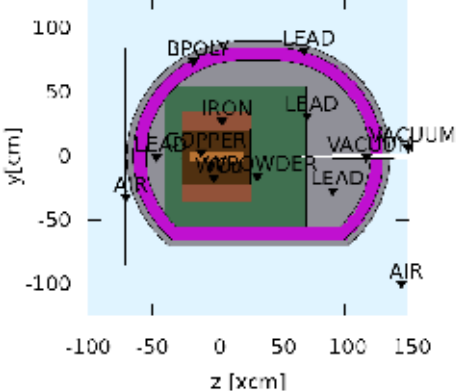
W/Pb z=0: Prompt Dose



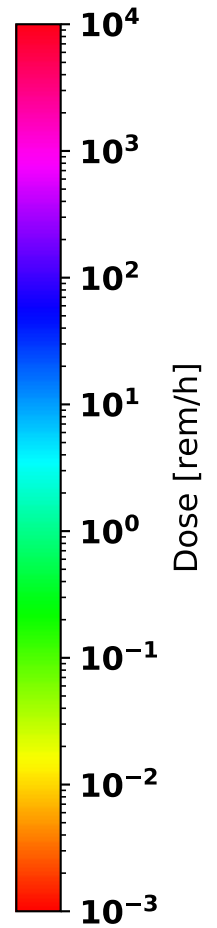
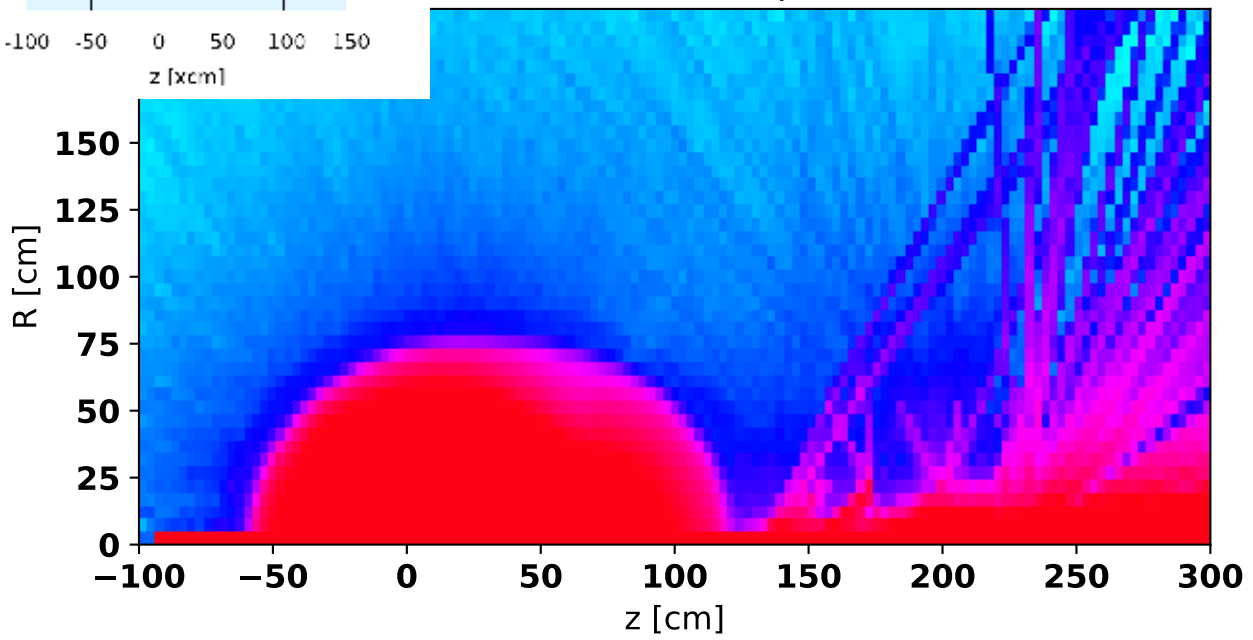


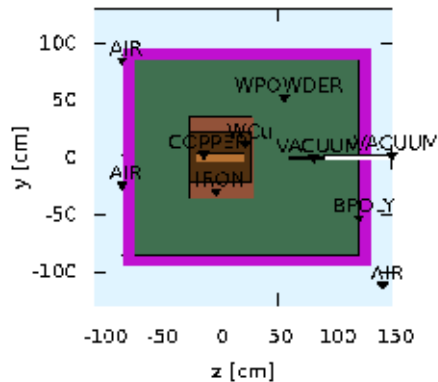
Gaussian doll 10/40: Prompt Dose



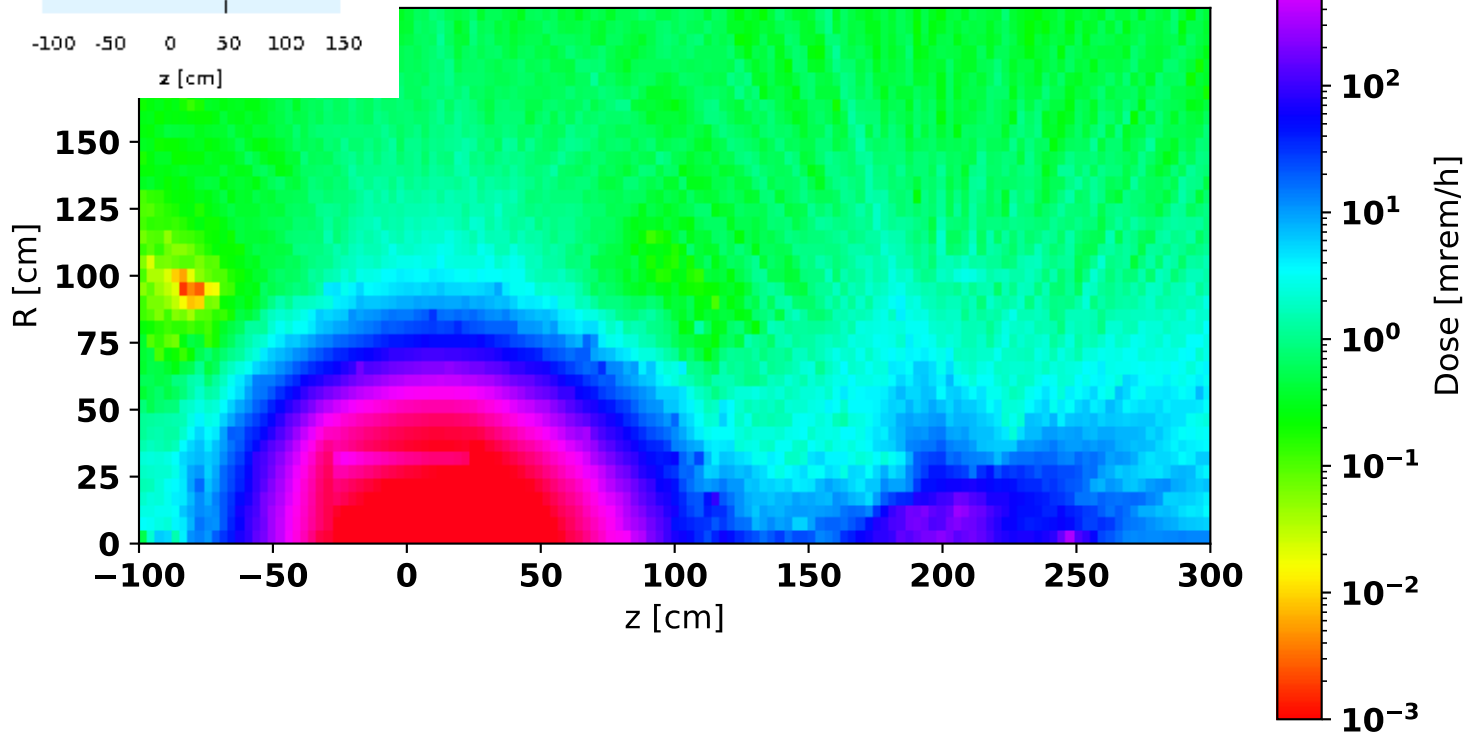


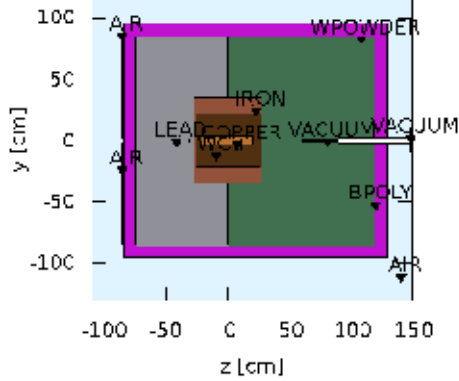
mkIII (f/s/w): Prompt Dose



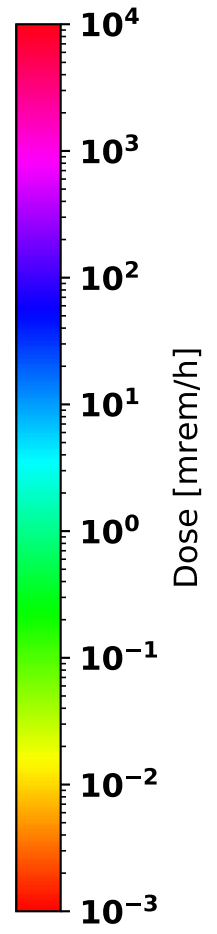
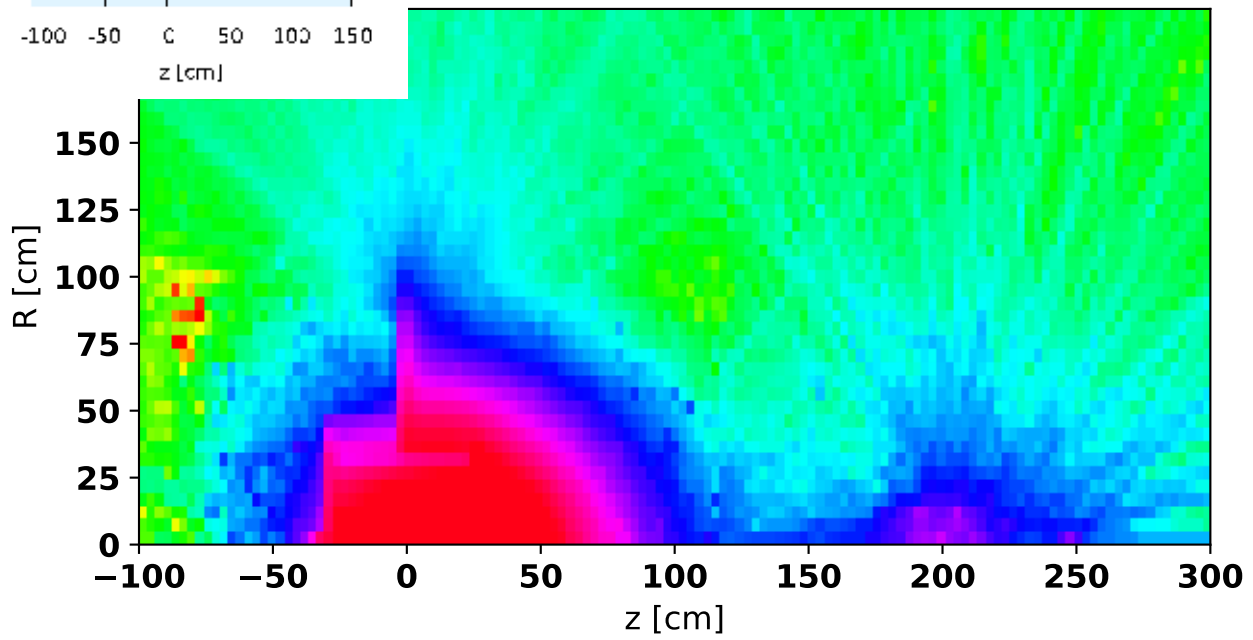


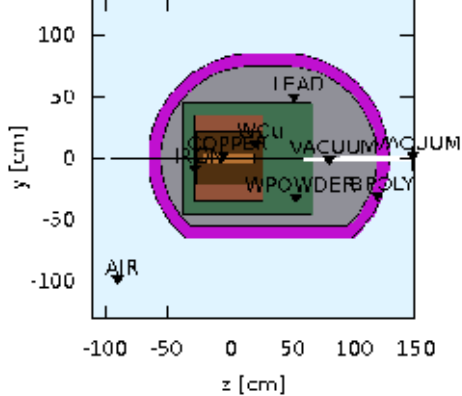
001: Activation. 1h cooldown



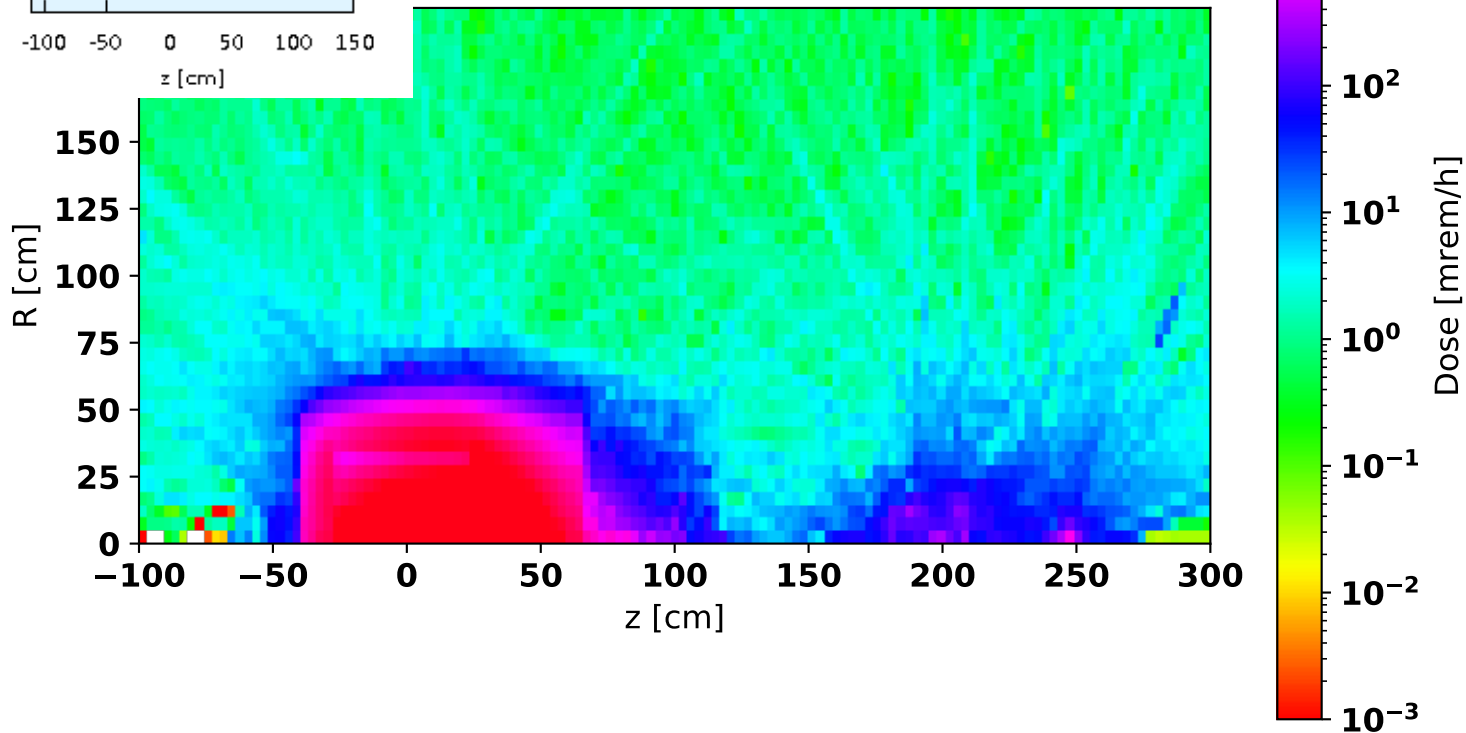


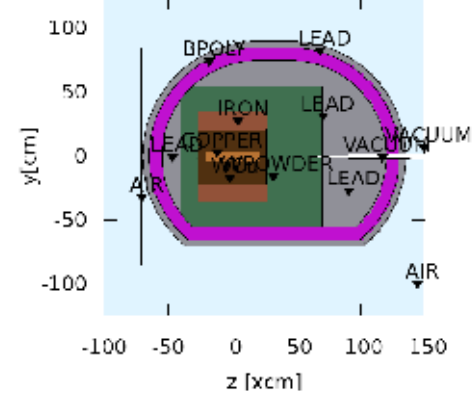
'b z=0: Activation. 1h cooldown



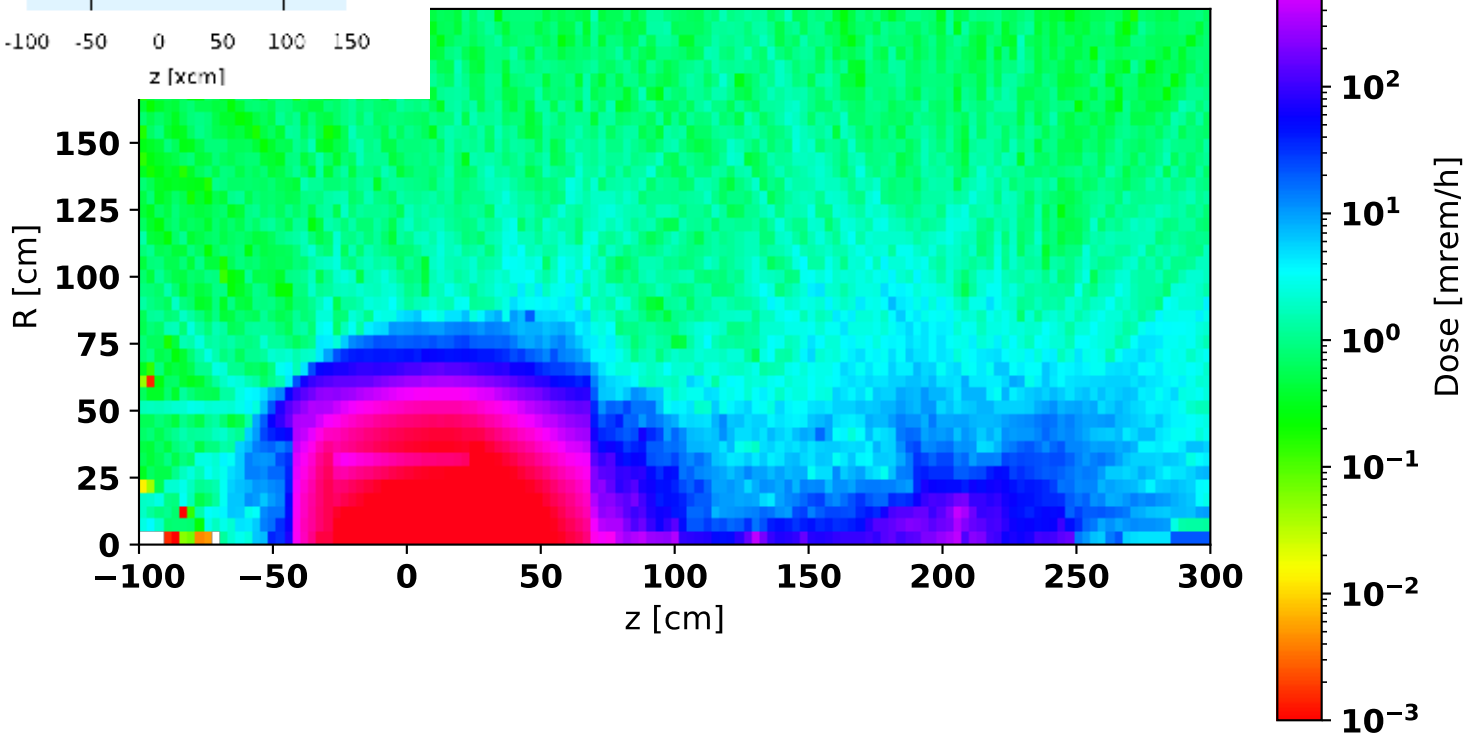


doll 10/40: Activation. 1h cooldown

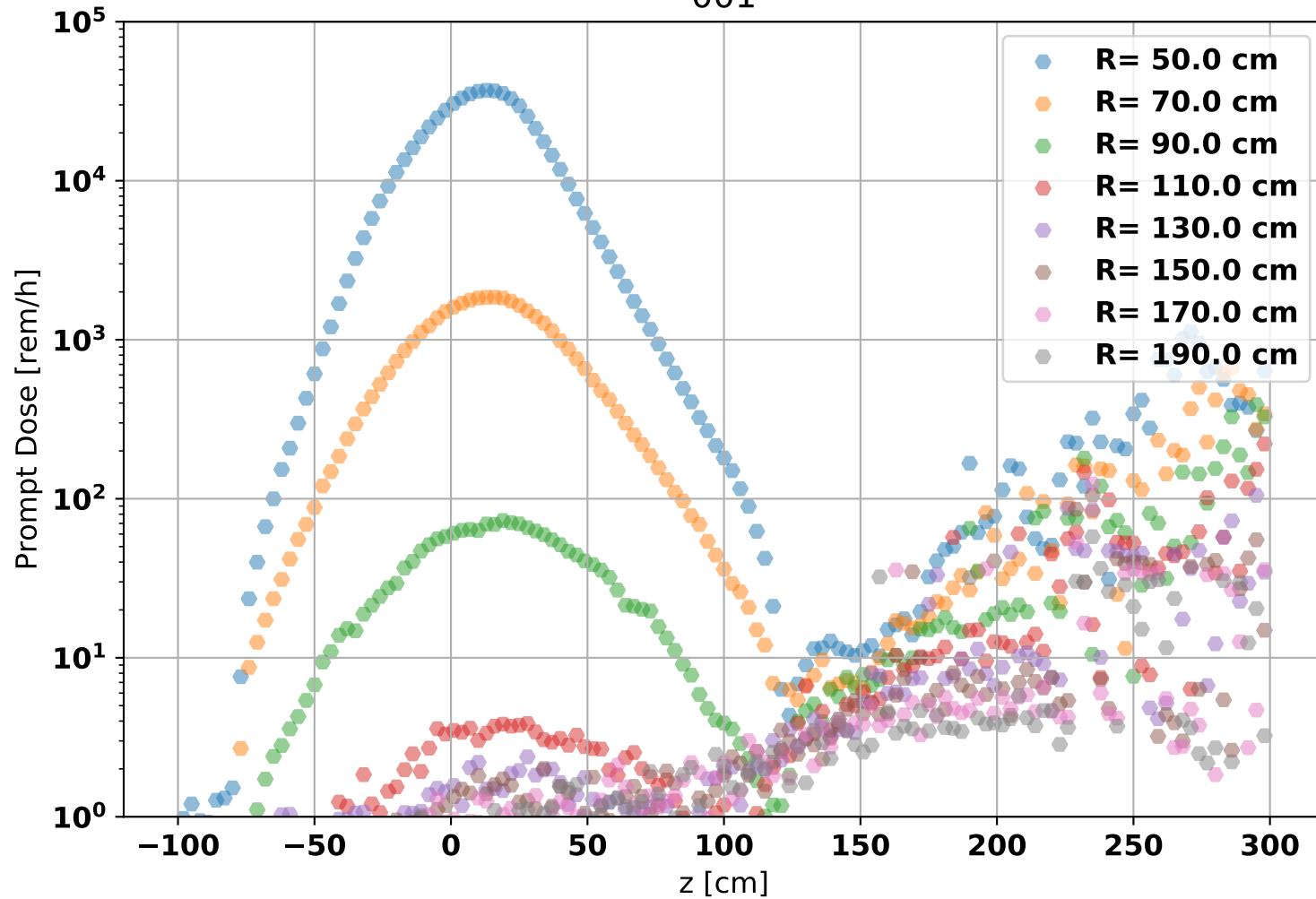




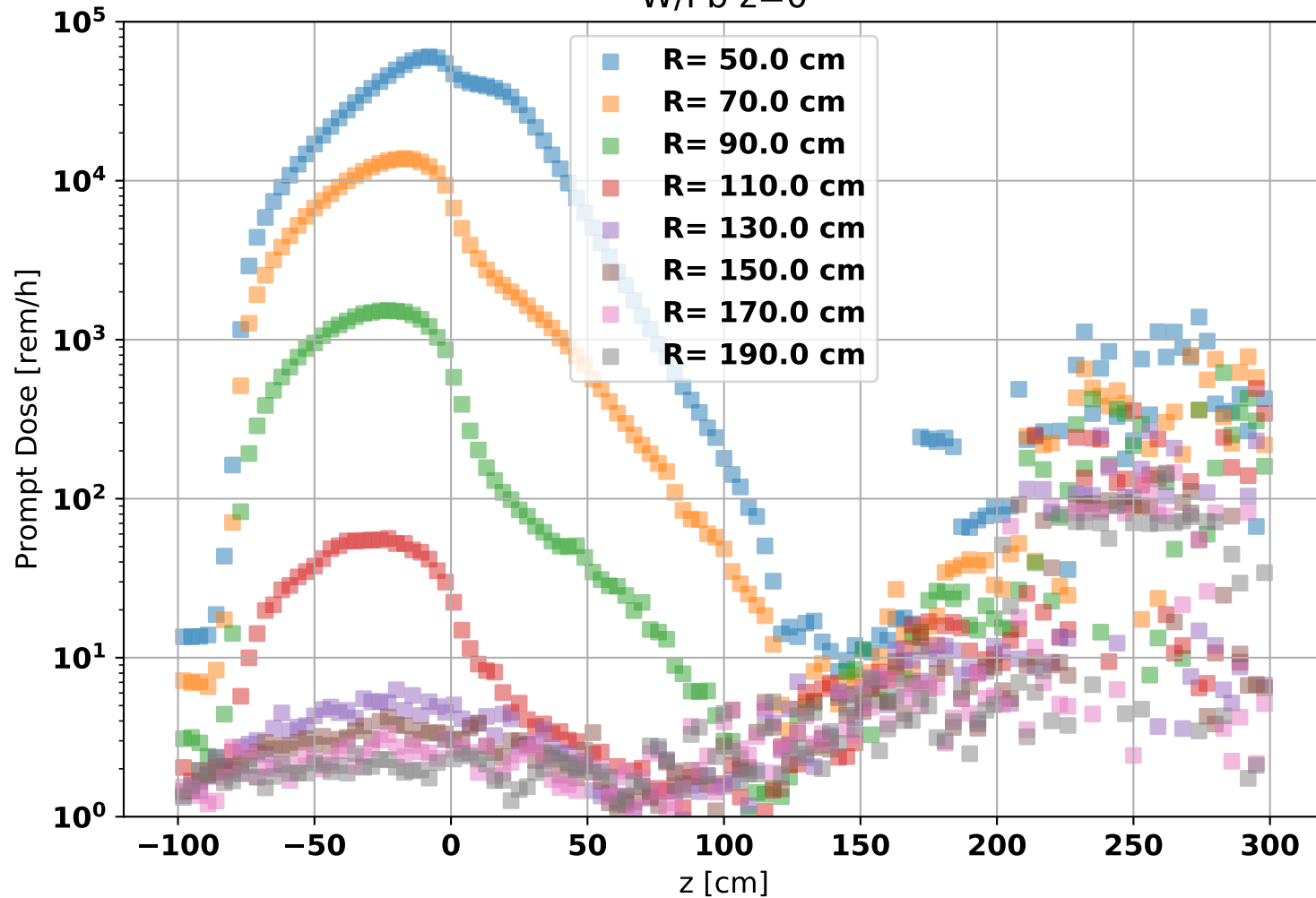
(f/s/w): Activation. 1h cooldown



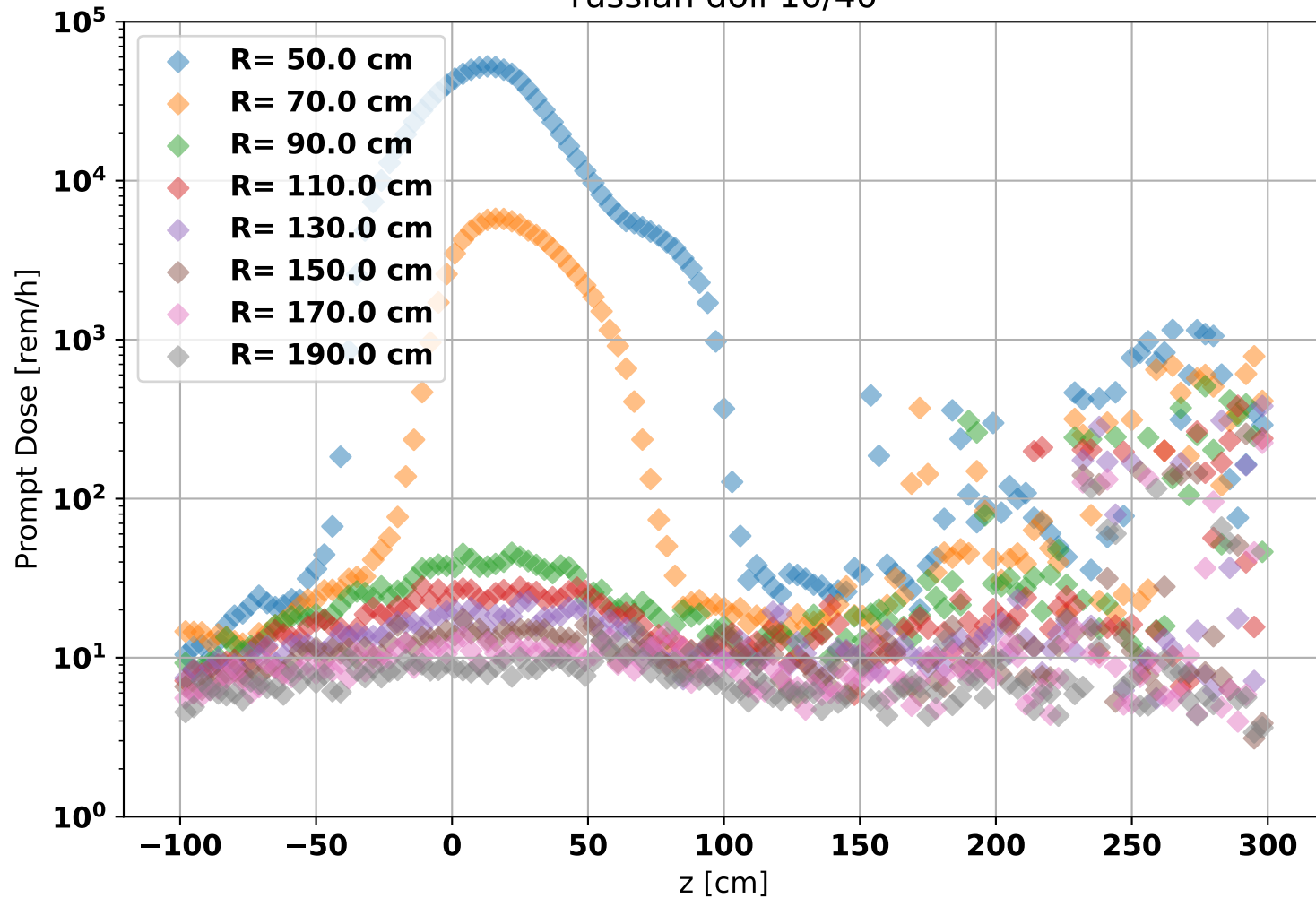
001



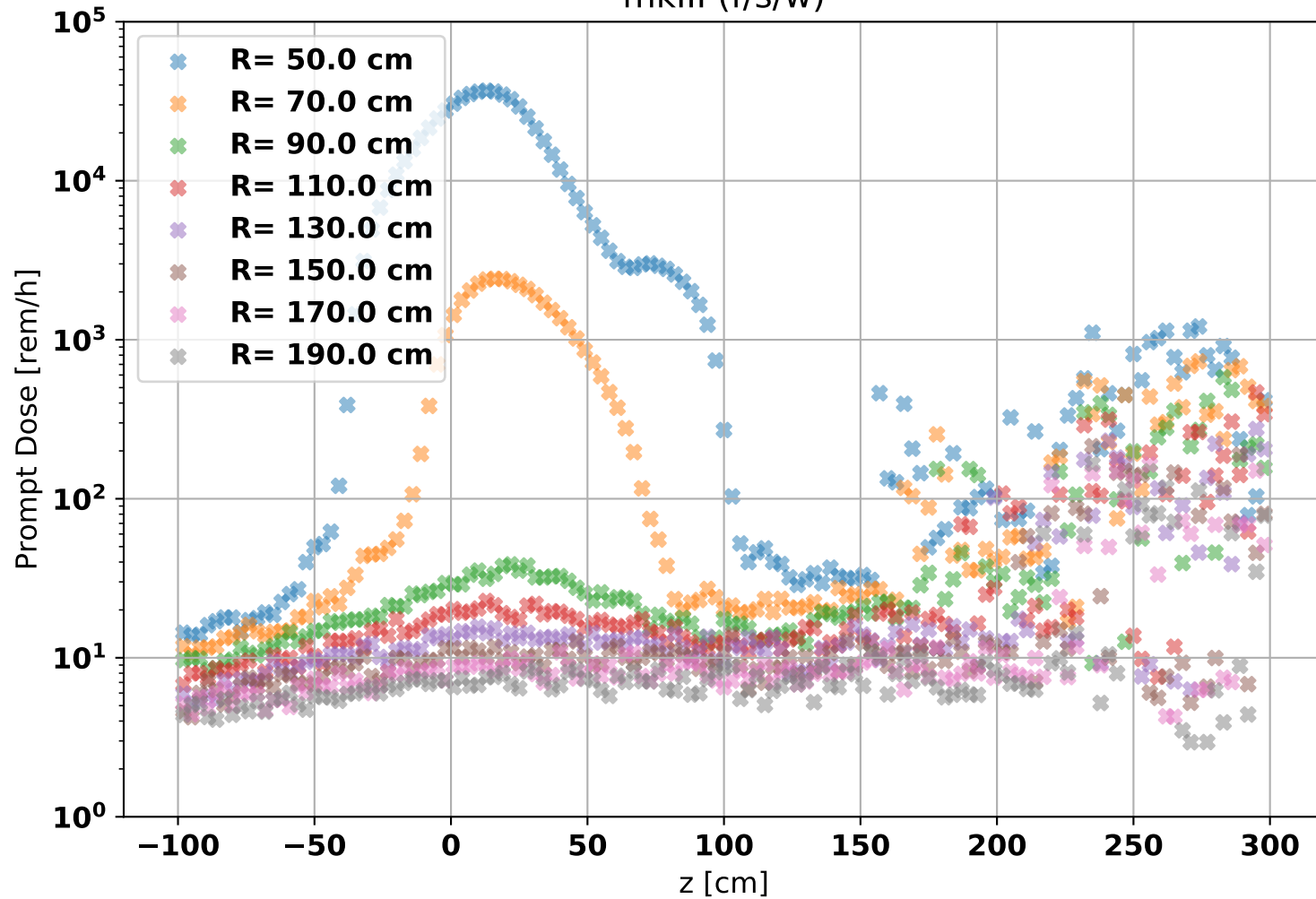
W/Pb z=0



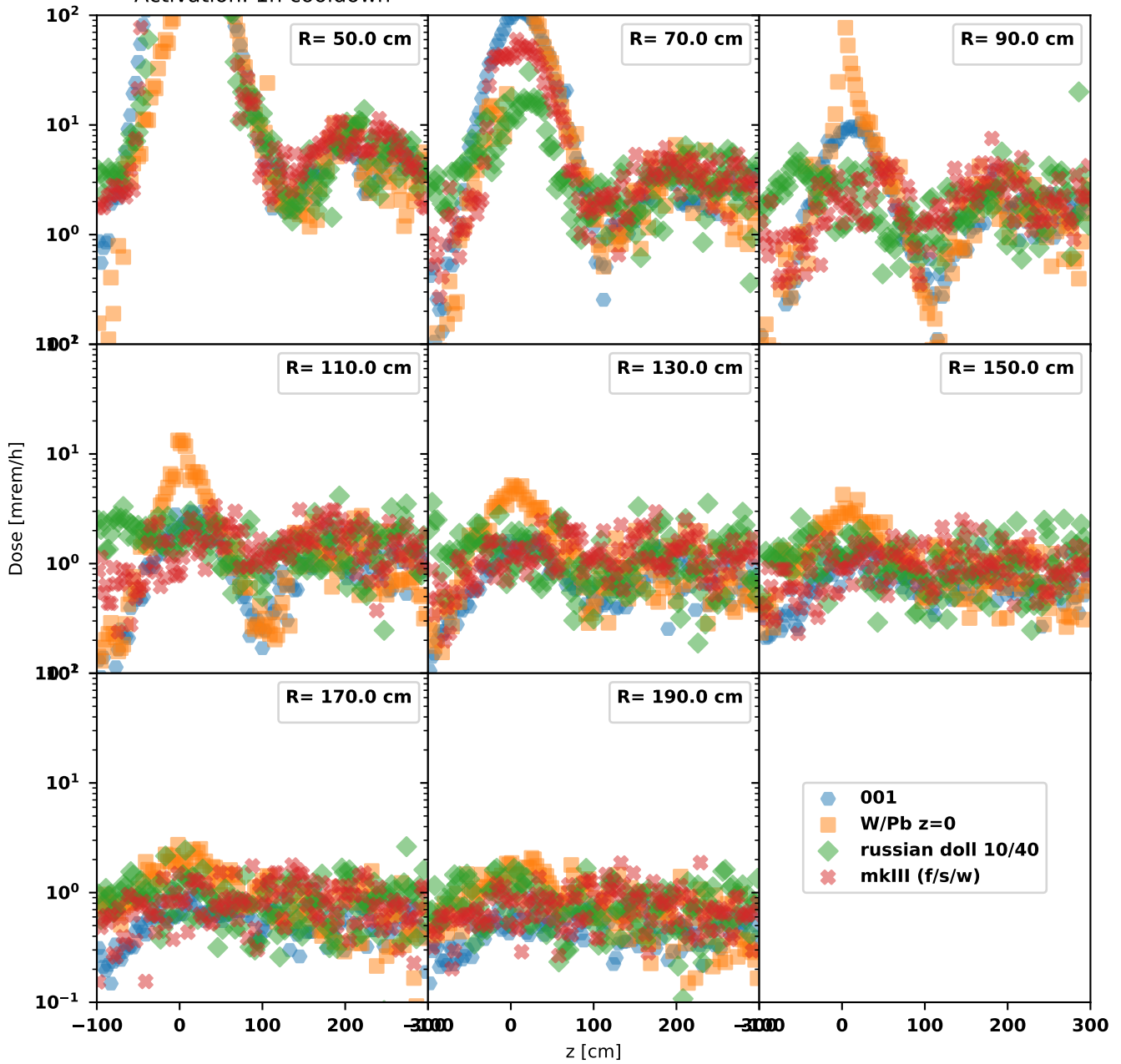
russian doll 10/40



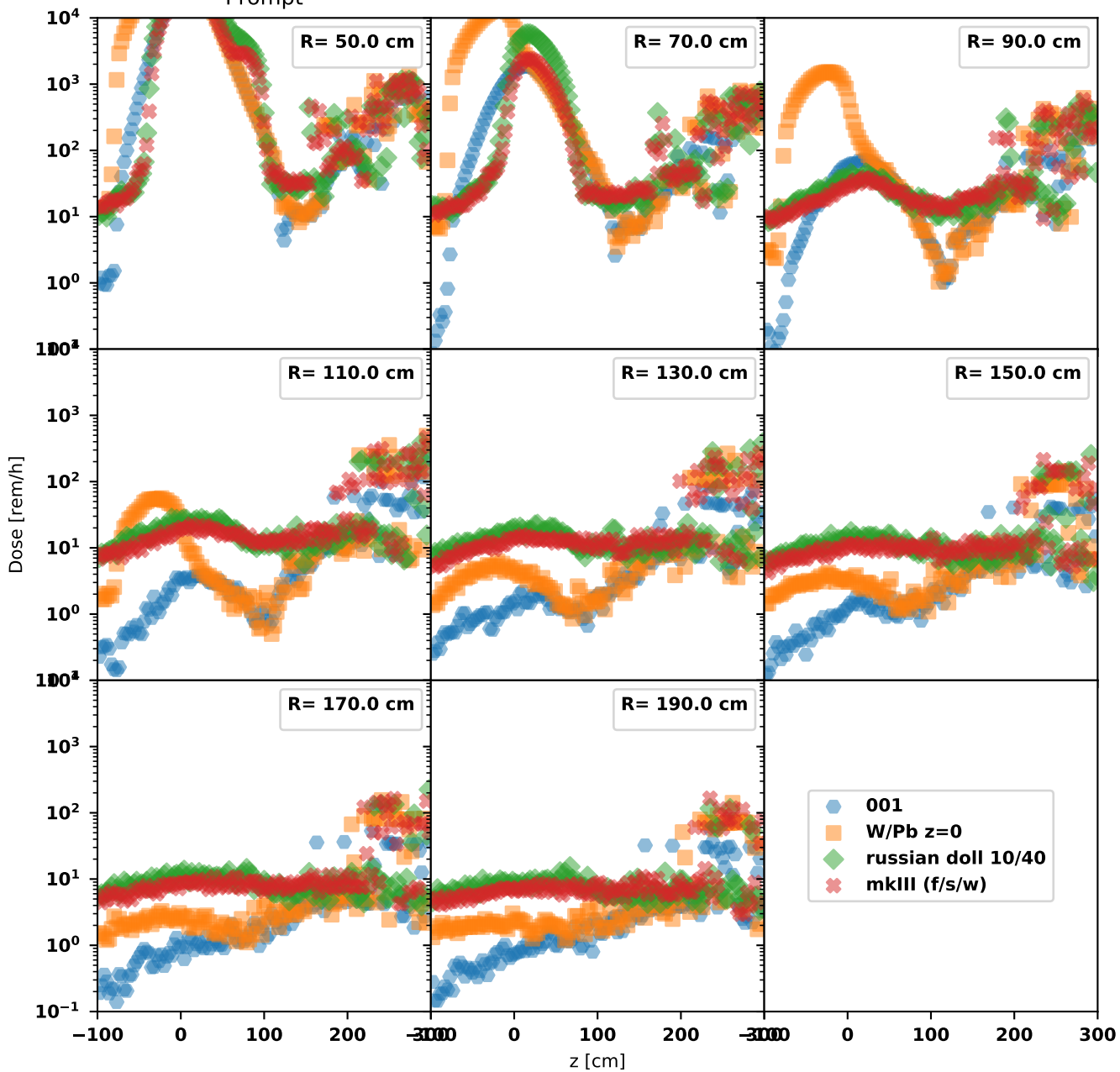
mkIII (f/s/w)



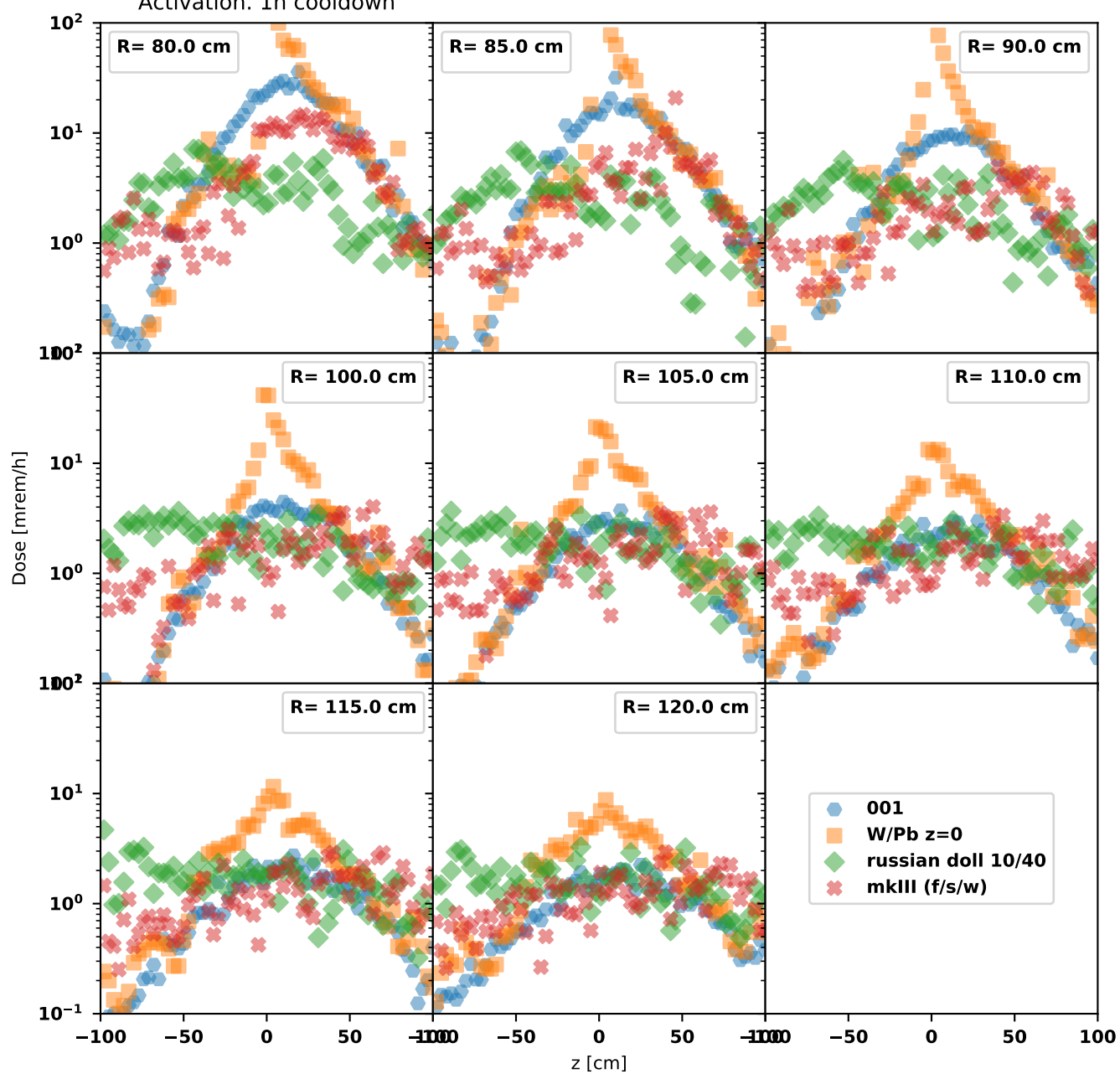
Activation. 1h cooldown



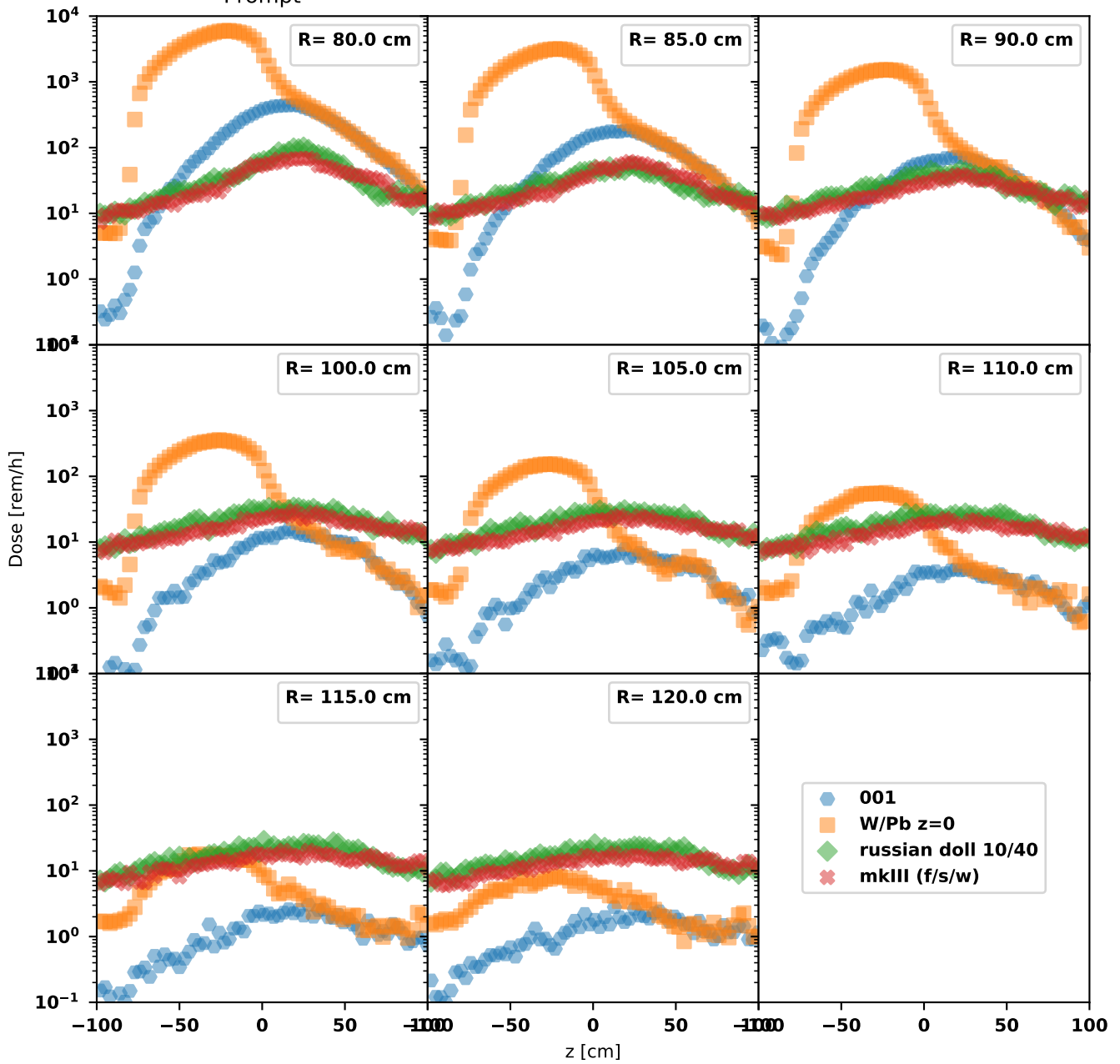
Prompt



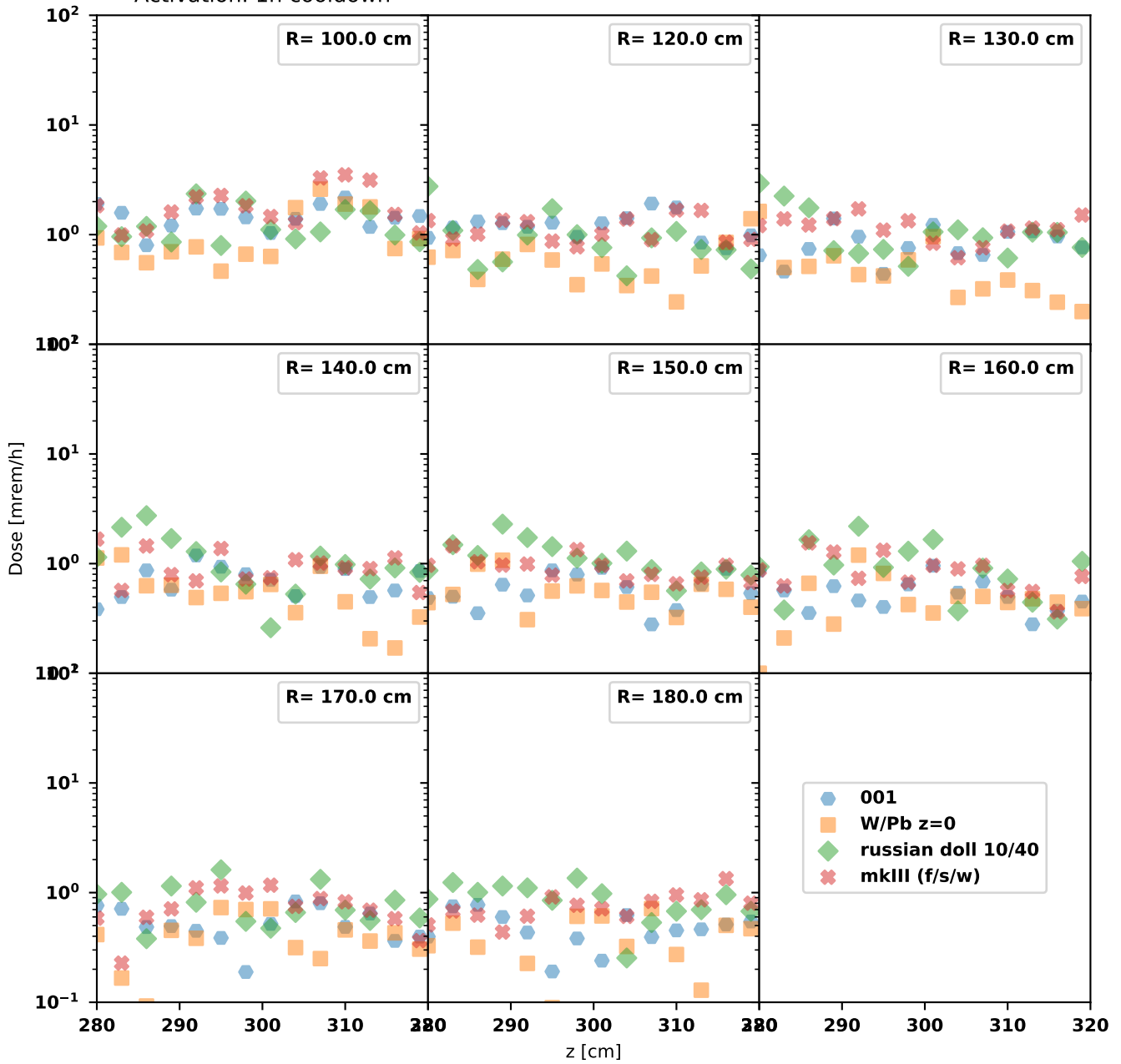
Activation. 1h cooldown



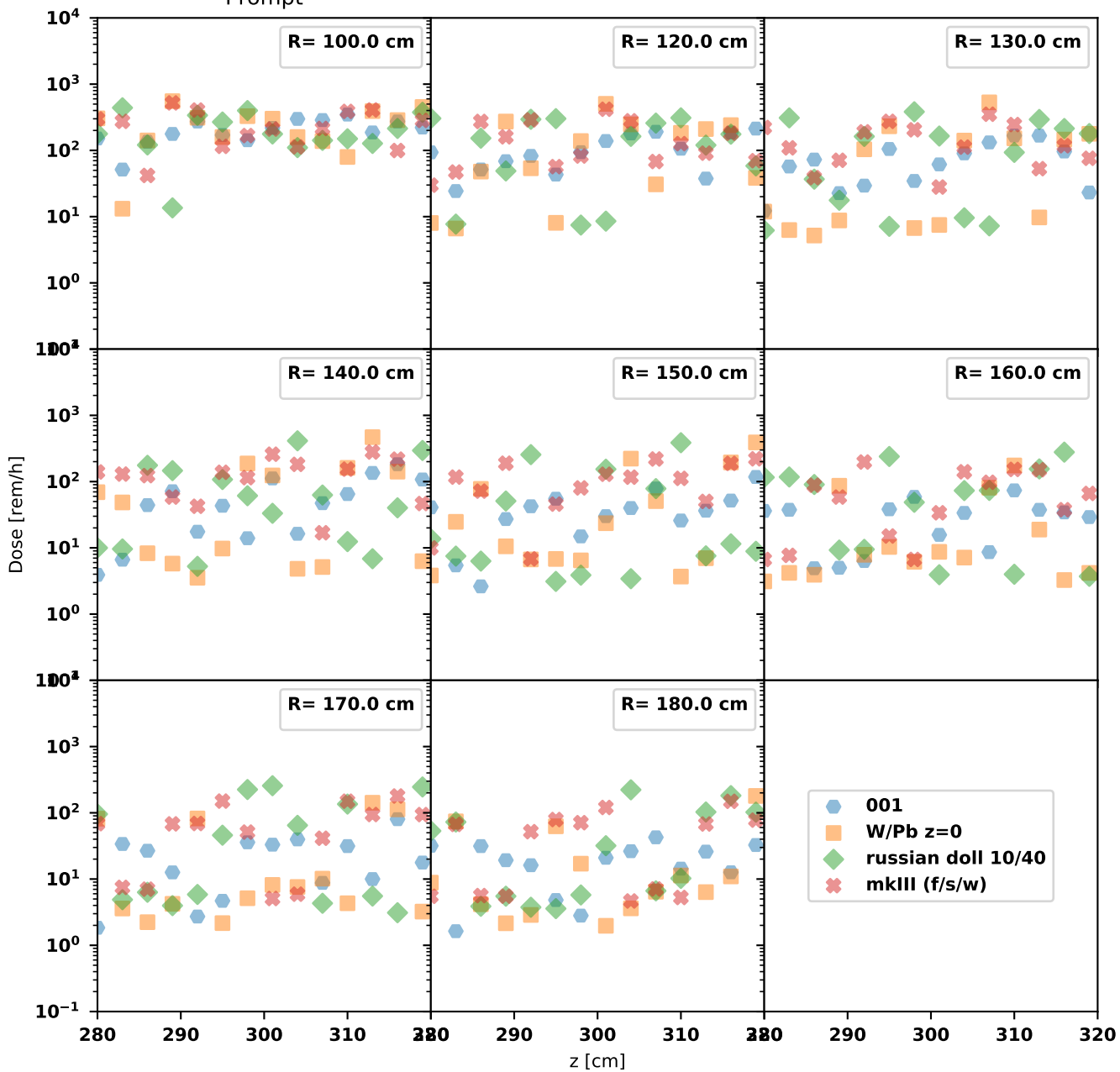
Prompt



Activation. 1h cooldown



Prompt



Summary & Outlook

GN's \$0.02 worth...

- hybrid config. available. More underway if needed.
- comparing/plotting (side-by-side, overlaps) of several models possible.
- If we can live w/ ~ 10 rad/h prompt radiation then a substantial in the WPowder is possible (need those firm numbers though!)

Thank you!