

INTREPID and ARTEMIS projects: Analysis of the new measurements



May 9, 2025

- Gamma passing rates (GPR) for PDs predicted by the 2-D deep learning model
- GPRs for PDs predicted by the 2-D deep learning model and PDs simulated by MONACO TPS

- Data taken: 28th March, 2025, at Carregi Hospital, Firenze
- EPIP device incorporated with MONACO HD Elekta linac
- phantoms acquired: CIRS, Multiplug, soldo water phantom, slabs

CIRS and Multiplug phantoms

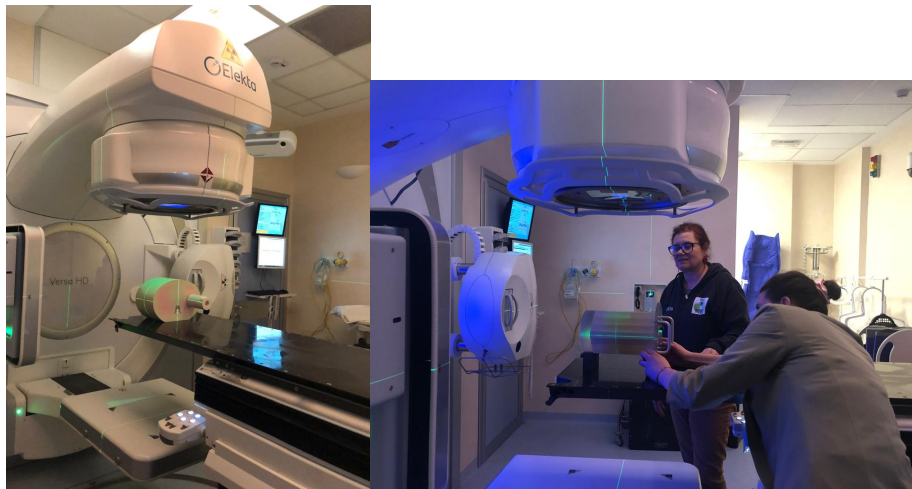
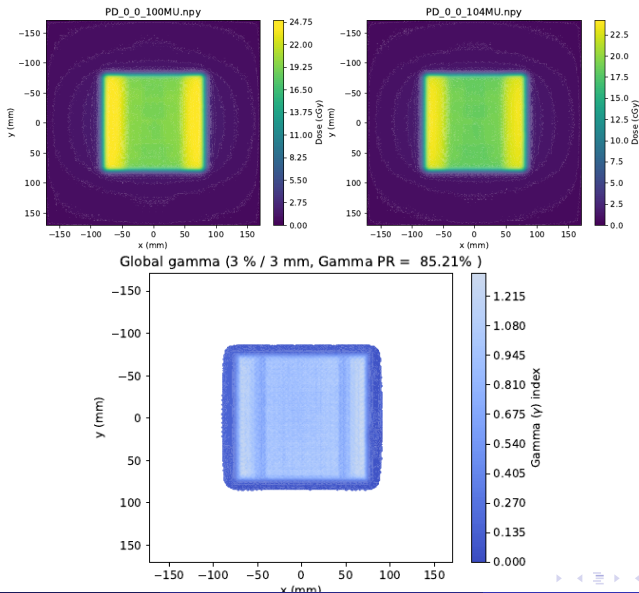


Figure: phantom set-up.

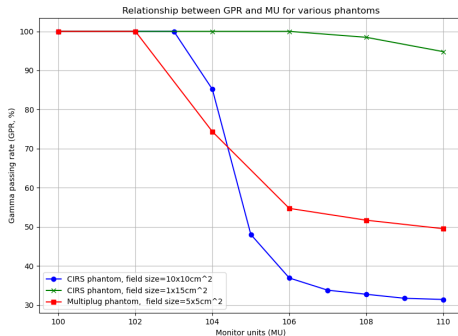
Reference and evaluation dose distributions



GPR vs MU-PDs by the 2-D model

CIRS and MULTIPLUG phantoms

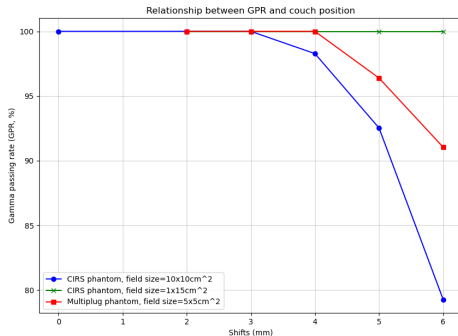
- DD/DTA:
3%/3mm
- Dose threshold:
10%
- Global gamma index



GPR vs shifts-PDs by the 2-D model

CIRS and MULTIPLUG phantoms

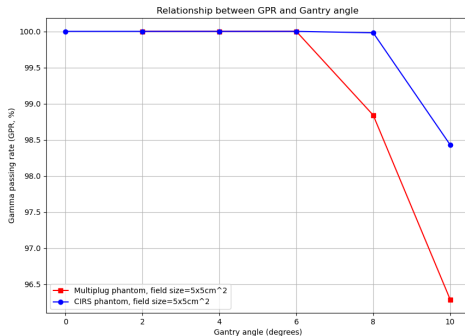
- DD/DTA:
3%/3mm
- Dose threshold:
10%
- Global gamma
index



GPR vs angle—PDs by the 2-D model

CIRS and MULTIPLUG phantoms

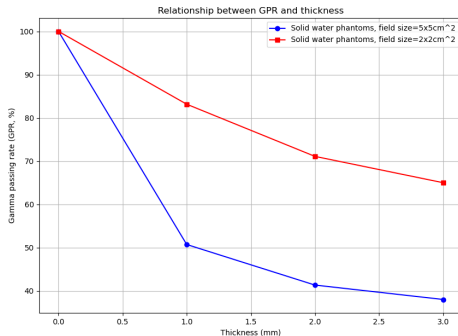
- DD/DTA:
3%/3mm
- Dose threshold:
10%
- Global gamma
index



GPR vs thickness–PDs by the 2-D model

slabs and water equivalent plates

- DD/DTA:
3%/3mm
- Dose threshold:
10%
- Global gamma
index



GPR vs MU–TPS pd and predicted PD by the 2-D model

MULTIPLUG and CIRS phantoms

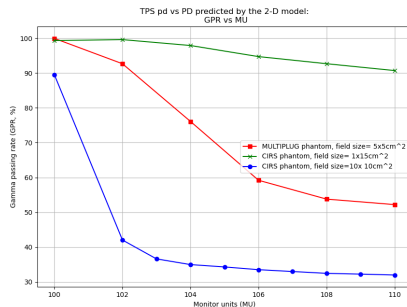
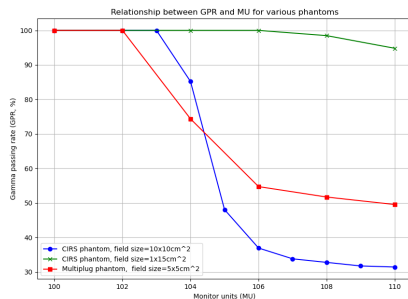


Figure: GPR against MU.

GPR vs couch shifts–TPS pd and PDs predicted by the 2-D model

MULTIPLUG and CIRS phantoms

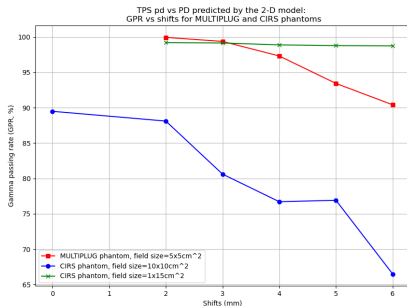
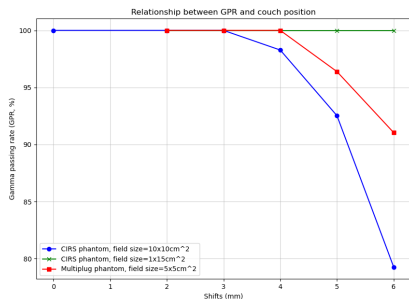


Figure: GPR against couch shifts.

GPR vs gantry angle—TPS pd and PDs predicted by the 2-D model

MULTIPLUG and CIRS phantoms

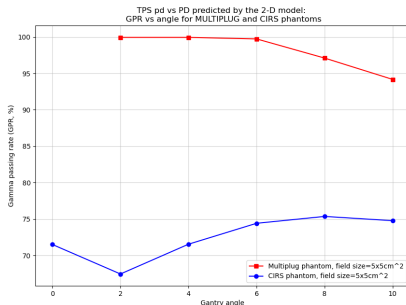
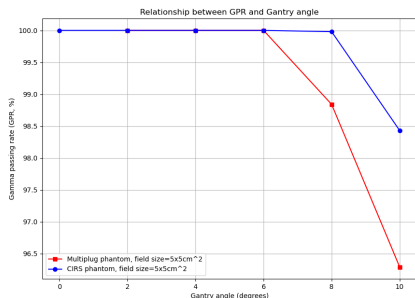


Figure: GPR against Gantry angle.

GPR vs slab thickness–TPS pd and PDs predicted by the 2-D model

Water equivalent plates.

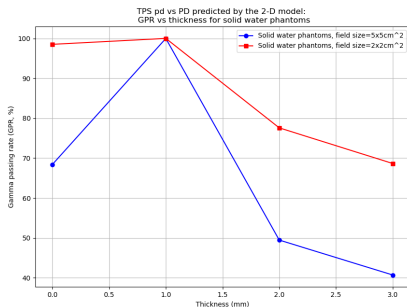
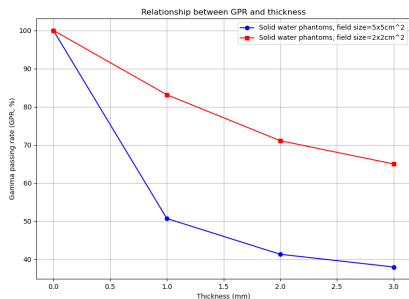
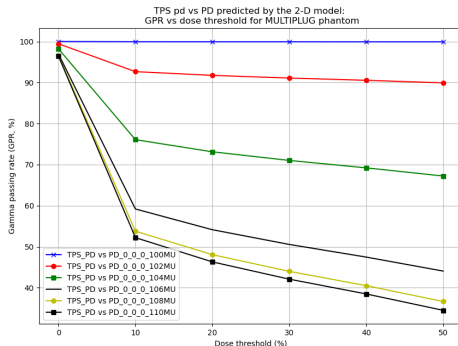


Figure: GPR against slab thickness.

GPR vs dose cutoff–TPS pd and PDs predicted by the 2-D model

MULTIPLUG phantom

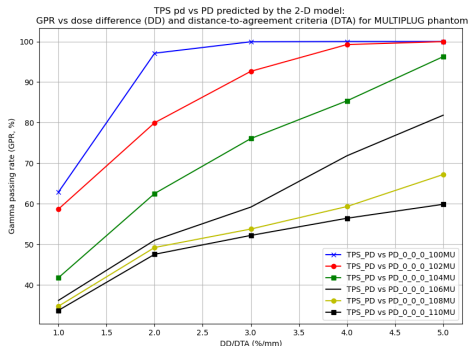
- DD/DTA:
3%3mm
- Global gamma index



GPR vs DD/DTA criteria–TPS pd and PDs predicted by the 2-D model

MULTIPLUG phantom

- Dose threshold: 10%
- Global gamma index



① Global gamma index:

- assessment of the impact of DD/DTA and dose cutoff criteria on the GPR for other phantoms, e.g., CIRS and solid water plates.

② GPRs for local gamma index:

- GPRs vs MUs, shifts, gantry angles and thickness, for all phantoms,
- assessment of the impact of DD/DTA and dose cutoff criteria on the GPR for all phantoms, i.e., CIRS, Multiplug and solid water plates.

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GRAZIE.....!