



Instantaneous dose-rate monitor for GIF++ Facility – INRNE, Sofia

1. AIDA : Integrated Dose Monitor – developed on the base of the RADMON for GIF++

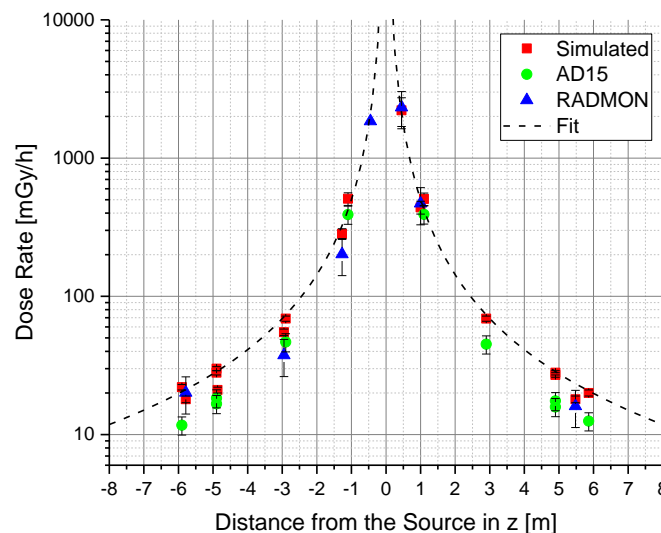
RADMON SYSTEM COMPONENTS



Data from simulations compared with the two dose-rate measurement campaigns of:

March 2015, done by RP using an 6150AD-15 GM counter.

From October 2015 till yesterday, done by EP-DT using RADMONs.



Conclusion – In addition to the Integrated Dose measurement - Instantaneous dose-rate monitor for GIF++ is needed

The measurement values agree to 12 % with the simulations – within the expected uncertainties.

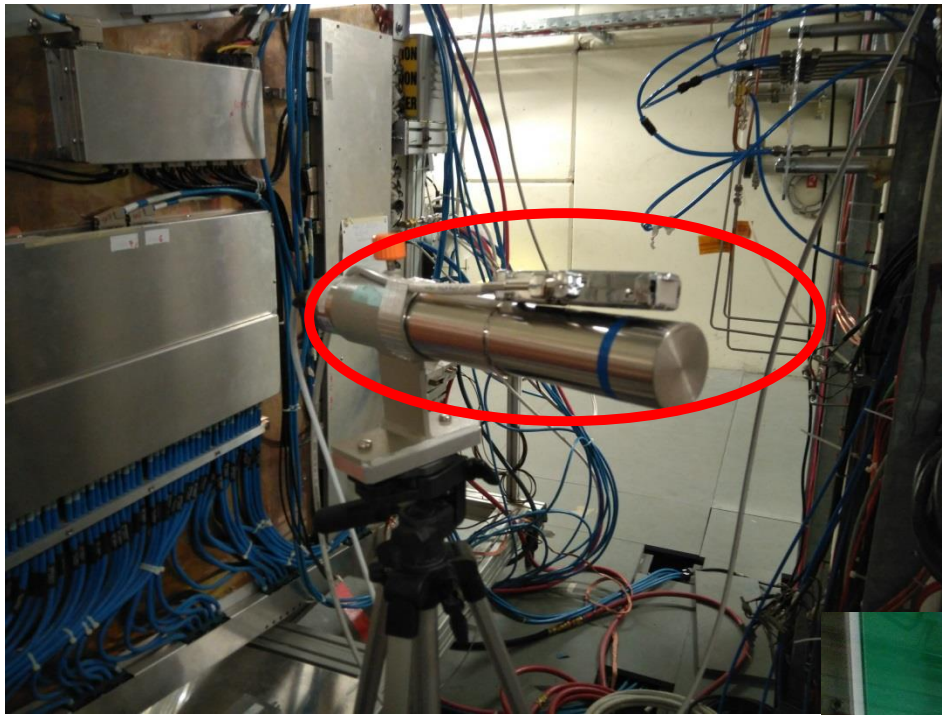
About half of the 662 keV photons loose energy mostly by Cherenkov scattering (lead of the filters, floor steel, concrete of walls, roof, different materials for irradiation).

2. Instantaneous dose-rate monitor (DRM) for GIF++ - AIDA2020

The first version of the 2 – channel counter board designed at INRNE, Sofia was tested at GIF++ - June 2016.

Final design – 8-channel dose rate monitoring board design and test – 2017/2018. TNA at Gif++ October – November 2017 for the test.

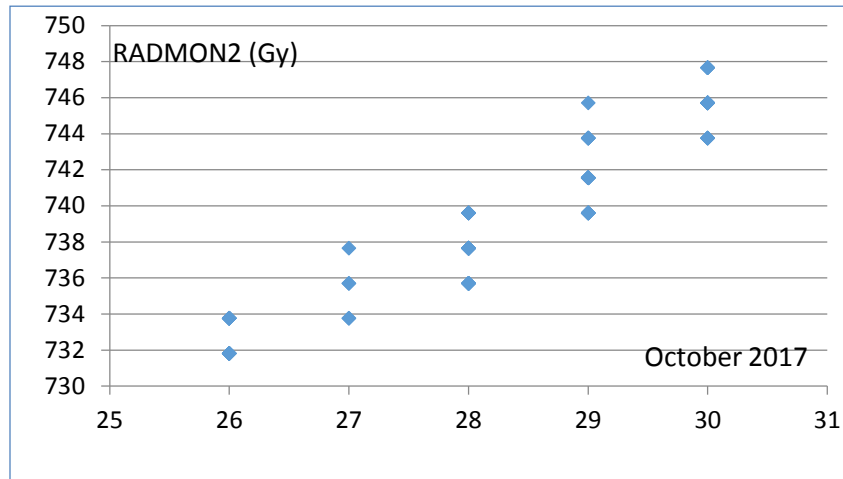




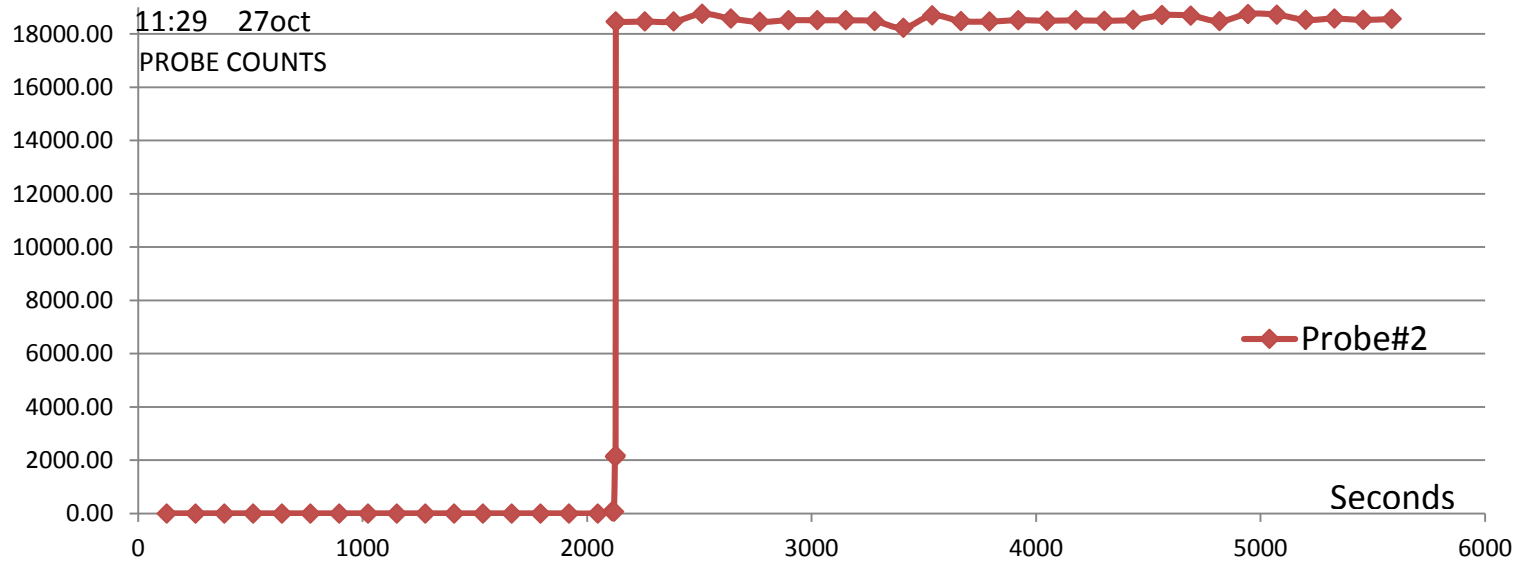
Test position of the RADMON Integrated Dose Monitor + Berthold GM dose-rate monitor Upstream and Downstream at Gif++



Radmon readings Upstream position



Berthold GM Upstream(probe2) cps



Comparison between the Radmon and Berthold GM probes

1. Berthold GM passport data

| | Units | Probe#1 | Probe#2 |
|--------------------|-----------------------|--------------|--------------|
| Type | | LB6500-4-H10 | LB6500-3-H10 |
| Background | [cps] | 0.08 | 0.014 |
| Calibration factor | [μ Sv/h per cps] | 0.617(0.55) | 7.05 (6.9) |
| Max. Range | [mSv/h] | 10 | 1000 |
| Deadtime | [μ s] | 80 | 15 |

2. Comparison for the irradiation period 26 – 30 of October 2017

| | Total dose Gy | Irradiation time hours | Dose per hour (RADMON) mGy/h | Probe counts cps | Probe cps (dead time correction) | Dose per hour (probe) mGy/h | Maximum cps per probe for the correct dose estimation |
|------------------|---------------|------------------------|------------------------------|------------------|----------------------------------|-----------------------------|---|
| RADMON2 + probe2 | 15.9 | 96 | 166 | 18500 | 25342 | 178 | 45500 |

Conclusion: RADMON and Berthold probe measurement differ by 12 mGy/h (7% of the dose). The difference is in the limit of precision for the RADMON and Berthold probe.