



### **DP** overview



Dipartimento di Scienze di Base e Applicate per l'Ingegneria



SAPIENZA

Università di Roma

# **Dose Profiler**

- ➡ Paper draft on the detector, prepared: G. Traini
  - Will be the reference for all the next papers to come. Will document the detector performance in view of clinical applications.
- ➡ Final word on matter effect: about to come
  - M. De Simoni: MLEM [almost done]
  - A. Sarti: 2D weights [not yet there...]
- ➡ Clinical trial is 'about' to start.
  - An update in the next slides will contain the 'detector' part + range monitoring task
  - The inter-fractional monitoring will be presented by M. Fischetti

# **Dose Profiler**

- → DP integrated with INSIDE2 since september (fully operational)
- Operational test performed in last Nov (23-25) was helpful. Aim: test the integration with the DDS + test the 'full chain' [CT + data taking + simulation] on a real case scenario (treatment)
  - Two different setup conditions were used to test the sensitivity to targets of different density
  - Learned a lot of things!





# The setup









### Test outcome

- Crucial to have some over voltage to account for voltage drop along the 25 m cables.
- → The DDS integration...

Not as smooth as expected. From time to time we get de-synchronized wrt the DDS

 this is potentially a problem: we use the DDS signal to 'follow' the treatment and
 understand (both online and offline) where we were shooting in order to compute
 the POCA. If we loose the sync, then we may compute the POCA wrt to a
 completely wrong point... Careful work has been done to understand what was
 going on.

Ongoing work in order to insulate the DP signals from the DDS: LNF electronics workshop is developing a new board with proper insulators. As this prevents the clinical trial to start, we're running as fast as we can..



## The tracks reconstruction

- ➡ Found back the expected performance.
- We shot a 'matrix' of PBs to cover one side of the plate that contained the different inset.
- Here's what we find in the plane that is perpendicular to the beam direction, in which the scan was performed.
  - The beam info is used when computing the POCA (that's why it is so beautiful :) )



### ARPG meeting

# Spotting different densities

- ➡ The hardest game... Just started..
- In order to compare properly the PBs we need first of all to fix the issue of de-sync with DDS.
  - This is almost done, being rechecked right now.
- Three different runs are now been processed: red and black are the very same treatment shot on the very same target. Blue is the same treatment but with density plate rotated... (so we expect that some of the PBs from blue should differ from the red and black that inspire should be somehow consistent)

Parallel work wrt what is done for the interfractional monitoring



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#### ARPG meeting

# Outlook

- ➡ Lot of work has been done
  - First paper draft circulated. See Giacomo's slides
  - Matter effect being finalised: learned a lot of things :) After first appear draft submission extra effort to close the discussion. More details in Micol's slides.
  - Inter-fractional monitoring + test beam @ nov: See Marta's slides.
  - clinical trial is about to start in early 2019... Lot of data, will need to carefully handle the clash with FOOT and other activities.