FREDAY

M. Fischetti for the prostate tumor

Thanks to A. Sarti, A. Schiavi, V. Patera

#IORESTOACASA

Target

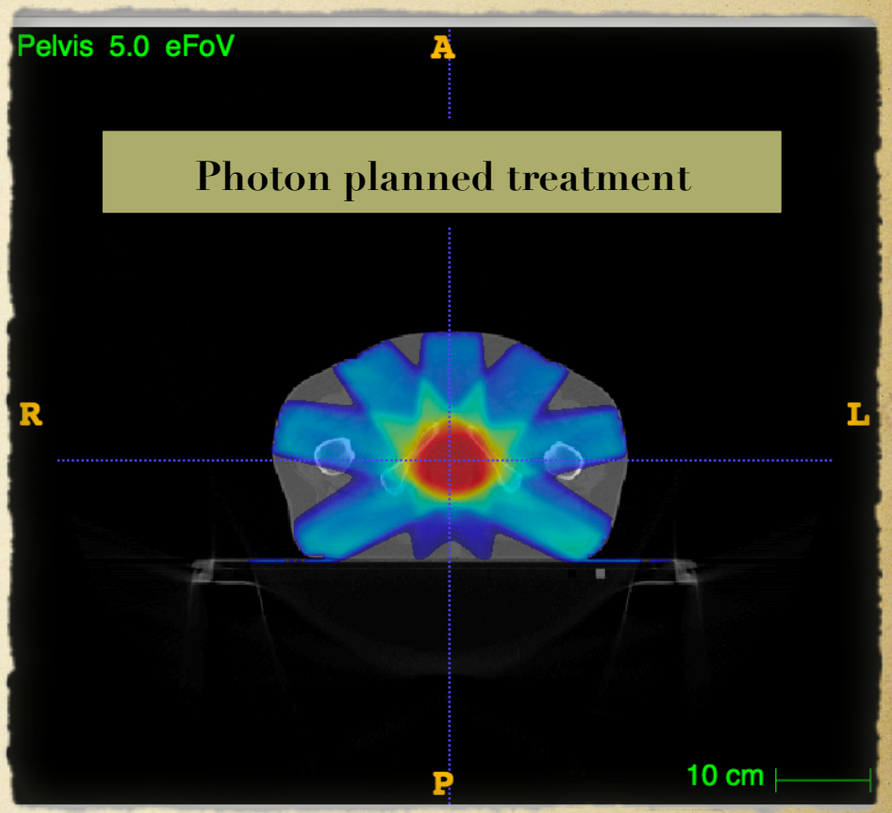
Are we able to reproduce with electrons a treatment plan made in the clinical routine with photons?

- The plan is to implement a TPS using high energy electrons and modelling the Flash effect as an RBE < 1 (sparing the healthy tissues). The RBE model will be tuned on the available data (thanks to Patrizia and Lucia)

- We already have a plugin in FRED that allows to shoot electrons and compute the dose released (under validation (Thanks to Gaia)). Our work will proceed in parallel wrt the development in the modelling of high energy interactions with matter

The starting point

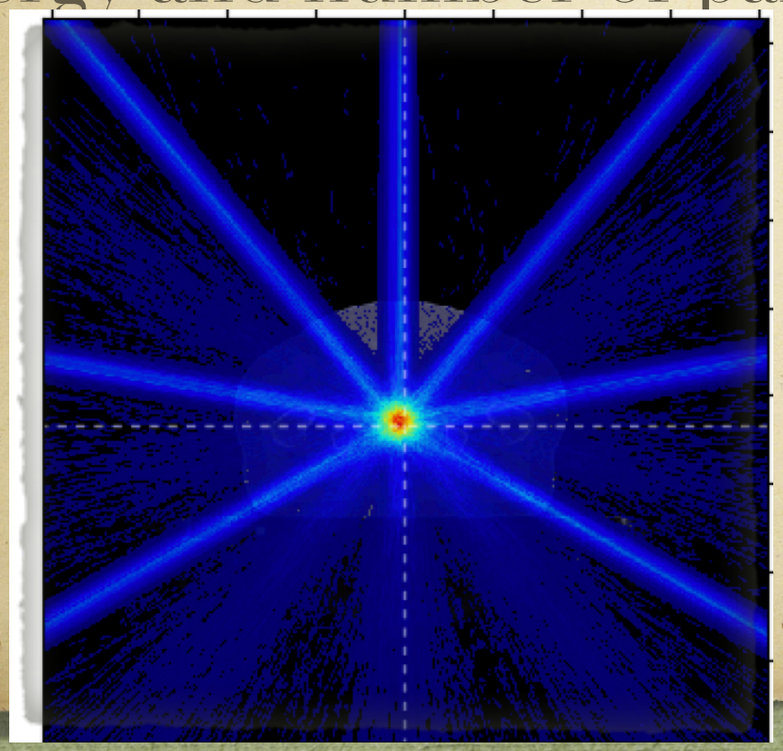
- Starting from tombolini input:
  - Prostate tumor planned with photons
  - He gave us CT, RTPLAN (plan information), RTSTRUCT (structure information, ex. PTV), RTDOSE (dose information)



- the plan is to used FRED to obtain the dose maps with electrons and optimize the treatment using the beam model parameters that we have been given by Andrea, Luigi, Lucia and co

First steps…

- Extract the dicom information: all the available structures (PTV, ROI…) and the plan full information
- Use the information to reproduce the field directions with respect to the isocentre.
- With FRED we were already able to obtain the dose distributions for the seven fields, using (for now) preliminary numbers for the energy and number of particles

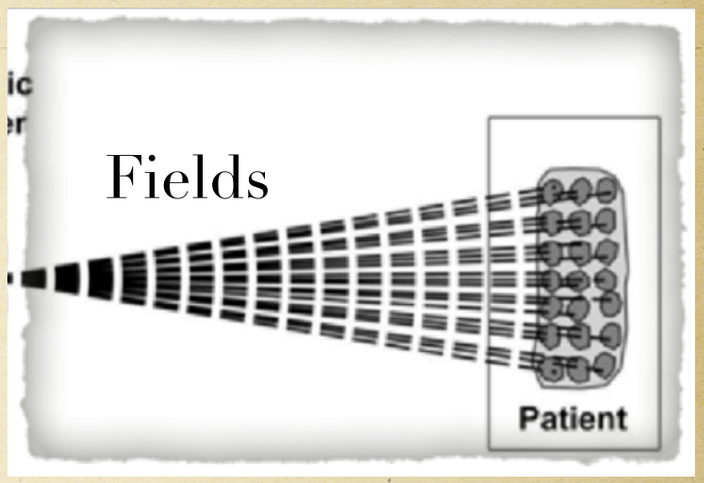


7 fields —>10^5 primary, 150 MeV

The fields directions match the requirement

Next steps

The plan is to use a technique similar to the active scanning to cover all the PTV



To understand how many fields to use , a FLUKA simulation will be performed studying the lateral spread of the electron beams at different energies

- Fred optimizer:
  Give it the matrix dose distribution for each field, PTV and organ at risk, and it will process and optimize the dose distribution.

Thanks