Hands-on Treatment Planning with matRad Instructions

1st Exercise - First steps on the TG119 phantom – photons vs. protons vs. carbon ions

By clicking on the image above the software will be loaded and the initial matRad screen will appear. Notice the different panels (Workflow, Plan etc.).

1. Load the TG119 phantom via the Load *.mat button (TG119.mat)

by following the path explained below:

For Windows: Load > This PC> WIN (C)> program files>matrad>application>phantoms

or in some computers: Load > My computer> (LOCAL DISK c)>program files>matrad>application

For Mac: Load>Applications>matRad>applications>phantoms and chose the first case TG119:

Click just once and wait. It should appear where the Outer target is the tumour that we want to radiate, core and body are organs at risk that we want to spare

Go to the part Visualization and chose visualize plan/beam so you can see in which direction beam is coming.

2. Set radiation modality to Photons and define one beam angle (gantry angle) 0°

3. Trigger dose calculation via button („Calc. Influence Mx“) so you can calculate the dose influence matrix.

4. Start optimization by clicking on („Optimize“) and analyze the resulting dose distribution.

When Optimization finishes our view changes:

5. Save the optimization result via („Save to GUI“).

Use the name of the phantom, radiation mode and the angle

ex. TG119_photons_oneagnle and save it.

6. Next, save the view with dose distribution by clicking at the photograph (screenshot) at the top and save it with the same name TG119_photons_oneangle in a chosen folder in Desktop.

7. After we save the view, you can show the DVH by („Show DVH/QI”). And resize it: After the resize, we need to save it with the name TG119_photons_oneangle_DVH, make sure you save it as JPEG image at the same folder you have saved the view:

8. Try to define a better photon treatment plan by defining more beam angles (e.g. equidistant beam angle spacing [0, 60, 120])., also at couch angle put 3 zeros by space on keyboard.

Repeat the steps 3-7.

Part 2. Protons

Change the radiation modality to: Protons and leave the beam angles unchanged.

Repeat steps 3-7 just change the name of the saving: TG119_protons_oneangle and compare the dose distributions on the basis of photons and protons.

Part 3. Carbon ION

Change the radiation modality to: carbons and leave the beam angles unchanged. Repeat steps 3-7 change just the name of the saving TG119_carbonion_oneangle