

# Particle Therapy Masterclass

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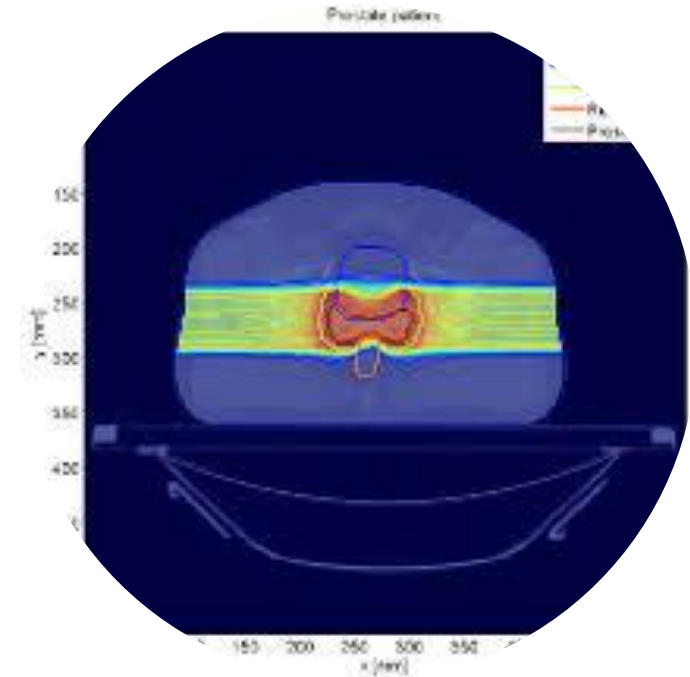
# Particle Therapy Masterclass in Sarajevo and Tuzla

- A Particle Therapy Masterclass was held in Sarajevo, and then in Tuzla, organized by the Department of Physics of the Faculty of Science. It is a global project of the world's top laboratories to popularize science, in which students are given the opportunity to be scientists for one day. The masterclass is a full-day activity for high school students and consists of introductory lectures given by renowned scientists, university staff and researchers from CERN.
- The interest was much greater than could objectively be accepted. In Tuzla, the masterclass was held in two schools, while the Sarajevo masterclass was held entirely online. Students had the opportunity to get acquainted with the principles and work of the mattress program, but also to work independently and interpret the optimization of radiotherapy treatment.



# Therapy planing of liver

- We loaded the Liver case in matRad.
- Setting up bixels for our case, setting up angles of beams, in our case for photons they were 0, 180, 225, 270 and 315 degrees.
- After setting up the angles we pressed calculate and following that we started optimizing
- Every of those cases we have saved via the option Save to GUI
- After the optimization we have saved the CT image and the DVH
- We have repeated the above steps for proton and carbon beams but we only had one angle for them which was 315 degrees



# Results

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- For photon therapy we have seen that even when using multiple beams we have still had results which are not as good as the results for proton therapy because of the dose falloff and the dose on surrounding organs
- Regarding the differences between the carbon ion therapy and proton therapy we can see that the carbon ion therapy has a much sharper dropoff in doses for target organs, but for the case of one beam the results are very similar
- In the conclusion we can say that, for this liver case, carbon ion therapy has the best results while the proton therapy follows closely behind and the photon therapy can be graded as the third best of the presented ones

# Conclusion

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After working and comparing data for different types of particles, photons, protons, carbon ions, students had the opportunity to engage in video conferencing and share results with their peers from different parts of the world. The young scientists were very interested throughout the masterclass, and the feedback from them is very important to us. They say that this masterclass is an exceptional opportunity for them to see what physics is when they come out of school, but also an opportunity to make contact with their peers and experts from different parts of the world.



# Thank you for your attention

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