

## Charged particle therapy: from treatment to imaging



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After graduating in Biomedical and Biophysics engineering from FCUL, Marta F. Dias went to Politecnico di Milano where she recently concluded her PhD studies in Bioengineering. During her studies, she worked in renowned institutions, such as MGH/Harvard Medical school and CERN. She is currently working as a postdoc in DKFZ (German Cancer Research Center). Her research topic is in charged particle therapy/imaging. Her work includes the development of algorithms to deliver dose to the patient and new modalities which use transmission imaging to improve the accuracy in charged particle therapy.

In recent years, the interest in using charged particles, such as protons and carbon ions, to treat cancer has shown a considerable increase with more than 140.000 patients being treated in 2015. The growing interest in charged particle therapy can be explained by their characteristic depth-dose curve. However, to take full advantage of this depth-dose curve, precise knowledge of the particle's range and patient interfaces is necessary. Range uncertainties in charged particle therapy are significant and different imaging methods have been proposed to deal with these uncertainties. The purpose of this seminar is to give a small introduction to charged particle therapy and an overview of the different imaging methods proposed to reduce range uncertainties.