Contribution ID: **197** Type: **Oral contribution**

A new facility dedicated to VHEE radiotherapy based on laser-plasma accelerators

Wednesday, 20 September 2023 16:25 (20 minutes)

The notion of utilizing very high energy electrons (VHEE) in the 200MeV range for treating deep-seated cancerous tumors has recently gained traction in the particle accelerator community. As a result, numerous technical advances aimed at developing medically sound conventional and non-conventional electron accelerators have emerged. Since late 2022, the European Innovation Council has been funding eBeam4Therapy, a project with the goal of optimizing VHEE beam performances for radiotherapy applications. This involves characterizing the 3D dose deposition, improving and scaling down each component of the machine, and ultimately building a laser-plasma accelerator that demonstrates technical feasibility while being economically competitive. In this discussion, we will explore the novelty of the project, the physics of electron acceleration at its heart, and the interaction between VHEE and tissues.

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Session Classification: WG5: Applications

Track Classification: WG5: Applications