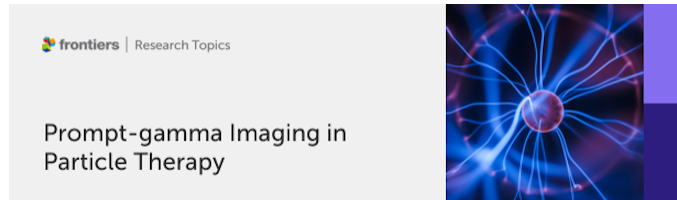


Prompt Gamma Imaging in Particle Therapy



Contribution ID: 1

Type: **Keynote**

Time-Of-Flight based PG detection for particle therapy

Friday, 7 July 2023 15:40 (1 hour)

Among the various techniques that are being proposed for particle range monitoring, Prompt Gamma Timing (PGT) potentially offers considerable advantages.

In PGT, the existing correlation between the incident ion path and the overall ion-plus-PG Time-Of-Flight (TOF) can be exploited to simply measure the ion range, or to retrieve a spatial information on tissue heterogeneities within the patient. The detection principle is trivial, requiring lighter and more compact detectors than other techniques, as no collimation system is necessary. The consequent higher detection efficiency and limited neutron background typical of PGT-based systems are expected to favourably impact on the technique sensitivity.

However, numerous limitations/challenges still remain to be addressed to fully exploit PGT potential, some of which are inherent to the technique while others are currently being overcome by different research groups. In this talk, I will give a review on TOF based PG detection: starting from the first proof of principle experiments, I will then present the efforts that are being made to improve the detection systems (in terms of time resolution, synchronisation, background rejection...) as well as the novel data reconstruction algorithms that are being proposed to increase the technique sensitivity.

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Session Classification: Keynote Presentation IV