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Optimization of EPURE LINAC performances and time characterization using electronic/photonic focal spot size correlation

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Following works aiming at optimizing photonic focal spot size measurement conditions on AIRIX, we decided to improve our electron beam picture processing software with a goal of studying a potential relationship between AIRIX electronic and photonic focal spot size dimensions. AIRIX electronic focal spot size is obtained from an OTR measurement chain established by adapted optics and an intensified camera. One of the photonic focal spot size measurement techniques is built by inserting an annulus pinhole into the AIRIX source collimation. Pictures are obtained from a gamma-camera. Our new electron beam picture processing software calculates physical electron beam dimensions (up to now, these dimensions were given as the statistic projection = "RMS dimensions") and allows to define a transformation coefficient allowing us to find again the photonic focal spot size values (established from a Lorentz fit of the photonic PSF) from electronic ones. We also showed the conservation of the electron PSF inclination degree after interaction with the AIRIX X-ray conversion target. A first photonic spot size estimation is given for the last hydrodynamic experiment at EPURE facility and implies great potential of such a diagnostic for the second stage of EPURE project, mainly in terms of duration optimization for the operating process of our next three radiographic axes.

Funding Agency

Footnotes

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Yes

Primary author: POULET, Frédéric (Commissariat à l'Énergie Atomique)

Presenter: POULET, Frédéric (Commissariat à l'Énergie Atomique)

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