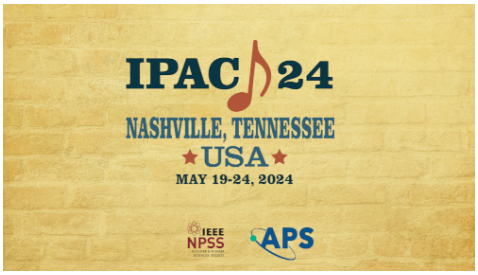

Contribution ID: **875** Contribution code: **MOPG76** Type: **Poster Presentation**

A compact water window X-ray source based on inverse Compton scattering

Monday, 20 May 2024 16:00 (2 hours)

X-rays in the water window (2.33 nm to 4.40 nm wavelength) can be used to provide high quality images of wet biological samples. Given the limited availability of current generation light sources in this energy range, table-top water window X-ray sources have been proposed as alternatives. We present start-to-end simulations in RF-Track of a water window X-ray source based on inverse Compton scattering. A brazing-free electron gun with a maximum beam energy of 7 MeV is considered, providing photon energies covering the full water window range. Performance estimates for the gun operating with copper and cesium telluride cathodes are presented. The cesium telluride cathode, combined with a burst mode Fabry-Perot cavity, allows for an increase in flux by orders of magnitude compared to single bunch copper cathode operation. A beamline of 1 m was determined to be sufficient to produce a high photon flux.

Footnotes

Funding Agency

Paper preparation format

LaTeX

Region represented

Europe

Primary author: MUSAT, Vlad (European Organization for Nuclear Research)

Co-authors: MALYZHENKOV, Alexander (European Organization for Nuclear Research); LATINA, Andrea (European Organization for Nuclear Research); GRANADOS, Eduardo (European Organization for Nuclear Research); OLIVARES HERRADOR, Javier (European Organization for Nuclear Research); BURROWS, Philip (John Adams Institute); DOEBERT, Steffen (European Organization for Nuclear Research)

Presenter: OLIVARES HERRADOR, Javier (European Organization for Nuclear Research)

Session Classification: Monday Poster Session

Track Classification: MC2: Photon Sources and Electron Accelerators: MC2.A23 Other Linac Based Photon Sources