



Contribution ID: 13 Contribution code: WEO08

Type: Contributed Oral Presentation

Cryogenic radiometry: a new absorber for X-rays up to 150 keV

Wednesday 17 September 2025 13:40 (20 minutes)

The accurate measurement of radiant power is essential for the calibration of X-ray detectors, such as silicon photodiodes. Cryogenic electrical substitution radiometers (ESRs) perform high accuracy, absolute, measurements of radiant power. Material and geometry of the absorber in an ESR are chosen to maximize the absorption in the energy range of interest, while providing a high thermal response and a short time constant. The highest energy design previously reported allowed the measurement of X-rays up to 60 keV. In this work we present a new absorber developed at the Canadian Light Source for energies from 25 keV to 150 keV. Monte Carlo simulations led to a design with an absorption > 99% in the entire energy range while considering all losses due to fluorescence and scattering. Measurements have been successfully performed at the Biomedical Imaging and Therapy beamline (05ID-2), which has a 3.7 T wiggler source and provides X-ray energies up to 150 keV.

Footnotes

Funding Agency

Author: PIMINCHUMO MARINOS, Omar Renzo (Canadian Light Source Inc.)

Co-author: VOGT, Johannes (Canadian Light Source Inc.)

Presenter: PIMINCHUMO MARINOS, Omar Renzo (Canadian Light Source Inc.)

Session Classification: Accelerators Session 1

Track Classification: ACCELERATORS: Absorbers