



Contribution ID: 2560 Contribution code: TUPL187

Type: **Poster Presentation**

Single-pass X-ray Compton source based on a Superconducting Accelerator

Tuesday, 9 May 2023 16:30 (2 hours)

Developments of new research areas and breakthroughs in science are often linked to the progress in new instrumentation. Here we briefly summarize the scientific opportunities and the proposed layout of an X-ray Compton source based on superconducting accelerator technology. The X-ray source is envisioned to provide scientists at Uppsala University and collaborating research groups with 100 kHz femtosecond flashes of X-ray radiation for discovering novel materials systems, investigating biological structures, and characterizing catalysts and nanostructures. The X-ray source is envisioned to consist of a normal conducting ultrahigh frequency electron injector, a 1.3 GHz superconducting linear accelerator, a 5 kW IR laser based on thin-disk technology, and two X-ray beamlines. X-ray pulses in a range 2-8 keV with a duration of 400 fs FWHM and a source size of 3 microns, containing 10^6 photons per shot into 1% BW are demonstrated through start-to-end numerical simulations. The X-ray source combined with a momentum microscope for performing time-resolved ARPES is considered to be a powerful tool for studying quantum materials for new sustainable technologies.

Funding Agency

Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary authors: OPANASENKO, Anatoliy (National Science Centre); DURR, Hermann (Berliner Elektronenspeicherung-Gesellschaft für Synchrotronstrahlung m.b.H.); SALEN, Peter (Uppsala University); CHULKOV, Ruslan (B.I. Stepanov Institute of Physics); YAROSLAVTSEV, Alexander (European XFEL GmbH); GORYASHKO, Vitaliy (Uppsala University)

Presenter: GORYASHKO, Vitaliy (Uppsala University)

Session Classification: Tuesday Poster Session

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