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New opportunities of coherent imaging and timing mode at the Elettra 2.0 storage ring light source

Wednesday 28 August 2024 11:40 (20 minutes)

Picosecond-long x-ray pulses of moderate intensity and high repetition rate are highly sought after by the light source community, especially for time-resolved fine spectroscopic analysis of matter in the linear response regime. We investigate the upgrade of the Elettra 2.0 diffraction-limited storage ring light source to radiofrequency transverse deflecting cavities generating a steady-state vertical deflection of selected electron bunches. The study demonstrates the feasibility of picosecond-long x-ray pulses at MHz repetition rate, provided simultaneously to several beamlines, and compatible with the standard multi-bunch operation. The short pulse exhibits a total flux at 1–10% level of the standard single bunch emission at the sample. Transverse coherence is preserved in both transverse planes up to few hundreds'of eV photon energy. Ultimate performance, limits and operational aspects of the scheme are analysed in an integrated accelerator-plus-beamlines perspective.

I plan to submit also conference proceedings

No

Primary author: DI MITRI, Simone (Elettra Sincrotrone Trieste and University of Trieste)

Presenter: DI MITRI, Simone (Elettra Sincrotrone Trieste and University of Trieste)

Session Classification: Mikrosymposium 10/1: New Lattices and IDs

Track Classification: 10. New lattices and novel insertion devices