Contribution ID: **109** Contribution code: **WEP29** Type: **Poster Presentation**

Elettra 2.0 discrete storage ring photon absorbers

Wednesday 17 September 2025 17:00 (1 hour)

The Elettra 2.0 project is upgrading the Elettra synchrotron radiation facility to 4th generation standards. This paper presents the overall photon absorption strategy adopted in the design, which includes both distributed and localized absorption of emitted photons, focusing on discrete photon absorbers and their geometrical configurations within the storage ring. All discrete photon absorbers will be manufactured entirely from Copper-Chromium-Zirconium alloy (CW106C or CuCr1Zr). The components will be produced using wire electrical discharge machining (EDM) for the main geometries, supplemented by conventional milling, with the integration of the flange knife-edge into the absorber geometry without the need for brazing. Two main absorber families are introduced: transversal photon absorbers, designed to protect vacuum chambers near bending magnets and to serve as initial beam-shaping elements, and axial photon absorbers, which function as transitions between different chamber geometries and protect sensitive components, such as RF contact bellows. The paper also presents the current production status and includes photographs of the first manufactured units.

Footnotes

Funding Agency

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Session Classification: Wednesday Poster Session

Track Classification: ACCELERATORS: Absorbers