



Contribution ID: 43 Contribution code: FRA12

Type: **Invited Oral Presentation**

Minimal invasive nano-fabricated wire scanner with sub-micrometer spatial resolution for FEL operation

Friday, 13 September 2024 09:50 (30 minutes)

The development of a sub-micrometer spatial resolution and minimal invasive wire scanner has been pursued at the Paul Scherrer Institute with a twofold aim. Providing for on-line monitoring of the SwissFEL electron beam transverse size and emittance during lasing operation while paving, at the same time, the way for the production of a new generation of customisable wire scanners, suitable for low and ultra-low emittance beam and superconductive machine.

Taking advantage of the experience gained in the past, nanotechnologies have been further investigated and photolithography through direct laser writing has been used to produce sub-micrometer low stress silicon nitride (Si₃N₄) wires free standing on a c-shape silicon fork. Each fork hosts two perpendicular wires for the reconstruction of the XY beam profile. The wires are 1μm wide and only 200 nm thick while their length matches the SwissFEL beam clearance.

Several prototypes have been successfully produced and installed in the SwissFEL.

We describe the wire scanner design and fabrication and first on beam performance.

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

Primary author: ADDESA, Francesca (Paul Scherrer Institut)

Presenter: ADDESA, Francesca (Paul Scherrer Institut)

Session Classification: FRA: Transverse Profile and Emittance Monitors

Track Classification: MC4: Transverse Profile and Emittance Monitors