Contribution ID: **445** Type: **Poster Presentation**

Nanostructured targets for advanced beam diagnostics

Tuesday 9 September 2025 16:00 (2 hours)

Transverse beam diagnostics with standard imaging techniques represent a challenge for next-generation accelerators and colliders due to the extremely small beam sizes, and X-ray interferometry offers an interesting method to overcome this challenge. In this regard, the X-ray Heterodyne Near Field Speckles (X-HNFS) technique has successfully been used to resolve few-micrometer beam sizes and at the same time attain a full 2D beam reconstruction. The method relies on diffracting the emitted X-ray radiation off a water suspension of spherical nanoparticles, which however pose several limitations for the full exploitation of the technique during normal operations. In this contribution we report on recent advances in the development of solid targets based on nanostructured materials with characteristics compatible with accelerator requirements. We present preliminary numerical and experimental results on the target design, prototyping and testing. Emphasis is given to the application as a transverse beam size monitor in the framework of the Feasibility Study of the Future Circular Collider (FCC) at CERN.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

Author: SIANO, Mirko (Università degli Studi di Milano)

Co-authors: NOSYCH, Andriy (ALBA Synchrotron (Spain)); PAROLI, Bruno (University of Milan); PIAZZONI, Claudio (University of Milan); BUTTI, Daniele (European Organization for Nuclear Research); SOLANO, Eduardo (ALBA Synchrotron (Spain)); RONCAROLO, Federico (European Organization for Nuclear Research); TRAD, Georges (European Organization for Nuclear Research); TORINO, Laura (ALBA Synchrotron (Spain)); POTENZA, Marco (University of Milan); MAZZONI, Stefano (European Organization for Nuclear Research); LEFEVRE, Thibaut (European Organization for Nuclear Research); IRISO, Ubaldo (ALBA Synchrotron (Spain))

Presenter: SIANO, Mirko (Università degli Studi di Milano)

Session Classification: TUP

Track Classification: MC04: Transverse Profile and Emittance Monitors