



Contribution ID: 272 Contribution code: TUP58

Type: **Poster Presentation**

## Study of X-ray Fresnel diffractometry for small beam sizes at Diamond Light Source

*Tuesday, 10 September 2024 16:00 (1h 30m)*

The feasibility of X-ray Fresnel diffractometry to measure small beam sizes beyond the resolution of X-ray pinhole cameras is studied for the case of Diamond Light Source. After the Diamond-II upgrade, beam sizes as small as  $4\ \mu\text{m}$  are anticipated and are not resolvable by the X-ray pinhole cameras, which are the workhorse for beam size, emittance, and energy spread measurements. X-ray Fresnel diffractometry employs a single slit with an optimised width, producing a double lobe diffraction pattern. The visibility of this double lobe intensity distribution relates to the beam size and promises micron-scale beam size measurement. Numerical studies and simulations have been conducted to assess the feasibility of diffractometry for Diamond Light Source. The parameters for the experimental setup have been determined and preliminary experimental results are presented. Challenges and improvements for achieving this measurement for Diamond-II are discussed.

### Footnotes

### Funding Agency

### I have read and accept the Privacy Policy Statement

Yes

**Primary author:** VITORATOU, Niki (Diamond Light Source Ltd)

**Co-author:** BOBB, Lorraine (Diamond Light Source Ltd)

**Presenter:** VITORATOU, Niki (Diamond Light Source Ltd)

**Session Classification:** TUP: Tuesday Poster Session

**Track Classification:** MC4: Transverse Profile and Emittance Monitors