



Contribution ID: 176 Contribution code: TUP05

Type: Poster Presentation

## An overview of the mechanical design of the quad crystal monochromator for the I20 XAS beamline.

*Tuesday 16 September 2025 17:00 (1 hour)*

A new QCM design that has been developed to replace the existing system on the I20 XAS beamline at Diamond Light Source will be presented. The QCM adopts a 4-bounce channel-cut configuration eliminating beam offset, which features two Bragg axes covering an energy range of 4-35 keV, each housing two pairs of S111 and S311 crystals. Thermal challenges are present, with a typical power load of 600 W and up to 730 W for the D-II upgrade. The design addresses thermal challenges with an optimised direct and indirect LN<sub>2</sub> cooling scheme. Precise crystal positioning is achieved by using very stable rotary and linear air bearings with high resolution alignment mechanisms. The design is influenced by prior FEA, thermal analysis, and mechanical tests to ensure a robust design ready for integration into the beamline.

### Footnotes

### Funding Agency

**Author:** TETRAULT, Callum (Diamond Light Source)

**Co-authors:** PEACH, Andrew (Diamond Light Source); DEVERILL, Henry (Diamond Light Source); HOOPER, Mark (Diamond Light Source)

**Presenters:** TETRAULT, Callum (Diamond Light Source); HOOPER, Mark (Diamond Light Source)

**Session Classification:** Tuesday Poster Session

**Track Classification:** BEAMLINES: Beamlines and Instruments