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## On the design of monochromators for high-resolution inelastic x-ray scattering

Traditional back-scattering high resolution monochromators for synchrotron light sources can't inadequately address the unique thermal problems of XFEL beam, especially seeded X-rays. Alternatively, LCLS-II-HE will support a novel in-line instrumentation design for ultra-high-resolution inelastic x-ray scattering based on perfect silicon crystals. The initial design of the monochromators applies zig-zag 4-bounce optical traces, before evolving into double-crystal monochromators (DCM). However, even DCMs can't meet the stability requirement of the system. In order to meet the stability and minimize thermal induced distortions, the final design has been settled to double channel-cut crystal monochromators (DCCM). Asymmetrically cut crystals are intentional designed to reduce the thermal intensity by spreading the beam over a larger surface areas. In this article, the reasoning processes of the design evolution and the final implementation of the monochromator designs will also be presented.

**Journal of Synchrotron Radiation Special Issue: will you submit your contribution?**

no

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