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# An energy dispersive bent Laue monochromator for K-edge subtraction imaging

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K-Edge Subtraction (KES) is a powerful synchrotron imaging method that allows the quantifiable determination of a contrast element (i.e. iodine) and matrix material (usually represented as water) in both projection imaging and computed tomography. With living systems, a bent Laue monochromator is typically employed to prepare imaging beams above and below the contrast element K-edge which focus at the subject location and subsequently diverge onto a detector. Conventional KES prepares the two beams by utilizing a splitter that blocks approximately 1/3 of the vertical beam size to prevent "edge crossing"energies beyond the monochromator.
A bent Laue monochromator has been developed that has very good focal and energy dispersive properties for KES. Approximately 4% of the vertical beam profile is involved in "edge crossing"energies, thus no splitter is employed. The beam can be narrowed vertically allowing a smaller crossover angle than a splitter based system which minimizes artifacts. The combination of good spatial resolution, energy dispersive properties, flux and a unique approach to data analysis make this system nearly ideal for KES.
Some of the relevant details of the monochromator will be discussed, especially the focal and energy dispersive properties, as well as, some details of artifacts caused by the beam focusing at the sample location. Example images of the beam and the object images will be presented as well.

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