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Spatial imaging of monochromatic hard x-rays from an APS undulator by the Kohzu double-crystal monochromator

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The spatial distribution of monochromatic x-rays produced by an APS undulator was imaged on a fluorescent screen and recorded with a video camera while commissioning the Kohzu double-crystal monochromator (DCM). Two sets of images were recorded: Case 1 in which the spectral output of the undulator is fixed (constant magnetic gap) and the monochromator is scanned in energy, and Case 2 in which the monochromator energy is held fixed and the spectral output of the undulator is varied by changing the magnetic gap of the insertion device. Because of the performance of the Kohzu monochromator, the mechanical conditions required to maintain the twice-diffracted beam could be preserved as the DCM was scanned in energy, allowing the evolution of the monochromatic radiation pattern to be observed as a function of energy. The images are compared with the calculated spatial distributions of monochromatic undulator radiation.

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