Harmonics-free Channel-cut X-ray Crystal Monochromator with focussing Effect

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X-ray crystal monochromators designed such, that the diffraction surface is machined into particular curved shape may favorably influence the properties of diffracted beam. As was shown by us earlier, a longitudinal parabolic or transversal groove may focus the diffracted beam in sagittal or meridional direction, respectively.
Another known example is a channel-cut crystal monochromator with curved diffraction surface which keeps the position of an exit beam fixed. Here, we show theoretically, that the channel-cut crystal monochromator with one diffracting surface machined into an exponential shape may reject higher harmonics in a broad wavelength range and at the same time the exit beam is convergent.

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