Spectral sampling of a soft x-ray tube emission by a lamellar multilayer grating in standard and conical mountings

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Abstract:

A Lamellar Multilayer Amplitude Grating (LMAG) etched in a multilayer mirror was designed for an efficient use in the 1keV region, through a multistep process involving sputtering coating, electron lithography and reactive ion etching. The multilayer structure has 115 B_4C/W bilayers of 3.1 nm thickness and the grating of 1.33 micron period has a small line to period ratio Γ equal to about 0.10. The properties of a LMAG illuminated in standard and conical mountings by a polychromatic radiation are given and the concept of “polychromator” based on a LMAG is presented. Taking benefit from the specific properties of a LMAG, the emission of a soft x-ray tube equipped with a copper target is spectrally analyzed with our LMAG in the Cu-L (930eV) region in standard and conical mountings. This experiment shows that a LMAG could be an interesting spectral analyzer for short-duration x-ray sources.

Preference for a poster presentation.

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