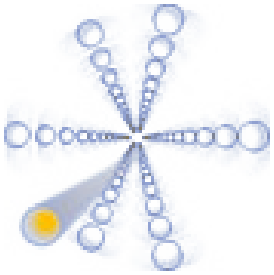

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Spectroscopy of Excited X-Ray Radiation Channeling through Micro-Channel Plates

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Capillary optics is a basic X-ray technology capable to deliver a high flux density with a sub-micrometer spot. This compact optics could be easily used used to guide and shape a X-ray beam characterized by a high intensity, a small spot, a low divergence and high homogeneity. We present here synchrotron radiation soft X-ray experiments performed in transmission with different types of micro-channel plates (MCP). The MCPs we used have a regular structure with a thickness of ~0.3 mm and are made on a SiO2 glass substrate with a hexagonal structure in the transverse cross-section with holey cylindrical channels (pore) of 3 micron in diameter.
X-ray reflection and fluorescence yield spectra have been collected at the exit of different micro-capillary structures under the condition of the total X-ray reflection. The fine structures of x-ray spectra, as well as the angular distribution of the field through microchannels have been analyzed for the energy corresponding to the anomalous dispersion region of the Si L2,3 absorption edge. The propagation of the excited fluorescence x-rays through these capillary waveguides, satisfying the multimode conditions, have been studied with a theoretical model including the transition layer at the surface of the sample.

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