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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 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 SiO<sub>2</sub> 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 L<sub>2,3</sub> 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.

**Primary author:** Dr MAZURITSKIY, Mikhail (Southern Federal University)

**Co-authors:** MARCELLI, Augusto (LNF); Ms DZIEDZIC-KOCUREK, Katarzyna (Smoluchowski Institute of Physics, Jagiellonian University, Krakow, Polan); DABAGOV, Sultan (LNF)

**Presenters:** MARCELLI, Augusto (LNF); Dr MAZURITSKIY, Mikhail (Southern Federal University)

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