# Focusing and Diffraction Properties of Micro-Channel Plates for Transmitted X-ray Radiation

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Synchrotron radiation sources as well as laboratory-based sources have been used to perform experiments with soft and hard X-rays through a new generation of Multi Channel Plates (MCP) devices. These experiments together with theoretical simulations on the propagation of radiation through flat and spherical MCPs, reveal fundamental properties of these unique optical elements.

Both focusing and collimation properties of thin cylindrically and spherically shaped MCPs, due to the transmission of a primary parallel radiation beam by a pattern of small hollow channels, have been analysed as a function of the bending radius. We will show also the angular distribution of the radiation at the exit of these MCPs and will present an evaluation of the transmission efficiency of MCPs with micro-channel diameters of ~10 μm.

Diffraction phenomena at the exit of these hollow X-ray waveguides were also investigated using the *Fraunhofer* diffraction model of waves at far zone. In the framework of this theoretical model we will present and discuss also the possibility to observe at the exit of a MCP, coherent effects due to radiation scattering phenomena.

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