

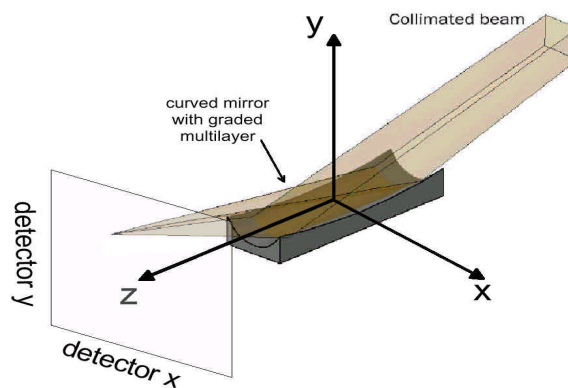
## Hard x-ray micro focusing with a single bounce multilayer optic

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The spatial resolution of many x-ray investigation techniques (microscopy, micro diffraction, micro absorption spectroscopy, micro fluorescence) is determined by the use of an x-ray beam with a small cross section in both directions. Several focusing techniques (Fresnel Zone Plates, Kirk-Patrick Baez mirror systems, or bent crystals) can be used to provide a beam size of typically a few square microns. The practical use, i.e. the alignment, of the latter micro focusing optics is, however, quite difficult and usually time-consuming. Some of the problems are caused by the fact that most existing focusing optics consist of two separate components, with which the focusing is achieved in the two different directions one after the other.



**Fig. 1:** Schematic drawing of the investigated x-ray optical device. It consists of a curved mirror substrate with a specially designed, graded multilayer coating.

With this contribution we present a novel x-ray optical device which focuses the beam simultaneously in two directions and therefore eliminates some of the problems mentioned above. It consists of a curved mirror substrate with a specially designed, graded multilayer coating (see Figure 1). The grading compensates for the variation of incident angles across the mirror surface. It was fabricated by XENOCS by DC magnetron sputtering [1].

The focusing properties of the optics were tested at the Material Science beamline at the Swiss Light Source (SLS). We will show that this new type of optics can efficiently compress a hard x-ray beam of a width of several hundred microns in both directions into a spot size of a few square microns. Since the device only requires a single reflection, the alignment of the optics is much faster and easier than in case of most currently used micro focusing devices.

[1] For further information, please refer to [www.xenocs.com](http://www.xenocs.com) (FOX-2D-CU 12\_INF).