A very simple method of sagittal focusing of synchrotron radiation is presented. It is demonstrated both by the ray tracing simulations and by the experiment that a reasonably good sagittal concentration of 8 keV synchrotron radiation by the diffraction on the walls of the cylindrical hole drilled into Si crystal may be achieved. The hole was drilled parallel with (111) planes and its diameter, 1 mm, was chosen such that the focusing distance fits the geometrical arrangement of BM5 beamline in ESRF. In our case the maximal focusing distance was 2 m. We have used two such crystals in the dispersive and nondispersive arrangement. The better result was achieved with the dispersive arrangement. The intensity in the center of the focus is increased 5 times with respect to unfocused radiation. The coincidence between ray tracing simulations and experiment is excellent.

In order to check the focusing ability of such optical elements, which utilize refraction phenomena occurring during Bragg diffraction, the special ray-tracing program was created.

Submitting author: N. Artemiev, e-mail: artemiev@fzu.cz