High Brilliance X-ray Laboratory System for Microdiffraction Studies

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An X-ray laboratory system is described optimized for diffraction studies of protein crystals and crystals under high pressure. The system is also suitable for phase contrast analysis, small-angle scattering and other investigations.

The system is based on a micro-focus X-ray source of 50W power. The source includes an x-ray tube with reflection anode and electro-magnetic electron beam control. The minimum focal spot size is of the order of 20 micron. Cu Ka X-ray flux at 50 W is 2×10^{13} ph/sec. For various solutions, the source can be equipped with different types of X-ray optical systems forming quasi-parallel or convergent beam. X-ray optical systems mounted onto the source provide for quasi-parallel X-rays of the order of 10^{10} ph/sec/mm^2 in the ∅ 200 micron beam.

Keywords: microdiffraction, x-ray source, protein x-ray crystallography