BL-17: New Structural Biology Beam Line at the Photon Factory

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The high brilliance beam derived from the mini-pole (mini-gap) undulator which is newly designed for the short straight section, U17, at the Photon Factory (PF) offers unique possibilities for structural biology. We propose two frontiers in this area, micro-crystal structure analysis and structure determination using softer X-rays. The extremely small beam size of the mini-pole undulator source, together with advances in X-ray optics allows that even with 2nd generation synchrotron facility, outstanding performance can be obtained at modest cost.

The main optical elements are the double crystal monochromator and the K-B mirror system for fine focusing. The monochromator consists of flat Si(111) crystals which are cooled with liquid nitrogen. The K-B mirror system after the monochromator focuses the synchrotron beam on the sample position. It consists of a flat-bent mirror for vertical focusing and an elliptical-bent mirror for horizontal focusing which is achieved by the "Arm Method" mirror bender. The BL-17 will deliver the first beam in September, 2005.

We describe the beam line optical design, the performance characteristics and the current status of the construction.

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