Equipment Development Center

VIII-EE Development of "Special Machine"

The technical staff of the Equipment Development Center is partly engaged in planning, researching, designing and constructing "Special machine." This machine, is a high-tech experimental instrument, with emphasis on newtechnical idea and co-operative work with members inside and outside the Institute including those in industries.

VIII-EE-1 Construction of the Evaluation Endstation Dedicated for Transmission Gratings

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A novel endstation dedicated for the evaluation of free-standing transmission grating have be en constructed at BL4B of the UVSOR facility in the course of the development project of soft x-ray emission spectrometer in collaboration with the department of vacuum UV photoscience. The transmission grating are planned to be used in a novel soft x-ray emission spectrometer, which covers 100–1000 eV region. The endstation is capable to measure the absolute diffraction efficiency as well as energy resolution limited by the imperfect grating structure. Figure 1 shows the schematic overview of the endstation, which consists of a chamber for target grating (a), a Si diode detector for the diffraction efficiency measurement (b), and a gas cell for the measurement of the energy resolution of the grating (c). The grating chamber is capable to move the grating along 5 axes by using a linear feedthrough and three micrometers. The position of the gas cell is controlled by a manupilator, and monitored by a laser interferrometer so that x-ray absorption spectra of gaseous sample can be measured by scanning the gas cell. The high precision slit located upper stream to the gas cell have two blades. The blades are manufactured by grinding using Electrolytic in-process dressing (ELID) method, which was introduced to the equipment development center through the collaboration with Nagoya university. First results have been obtained for a test grating chip in March 2003.

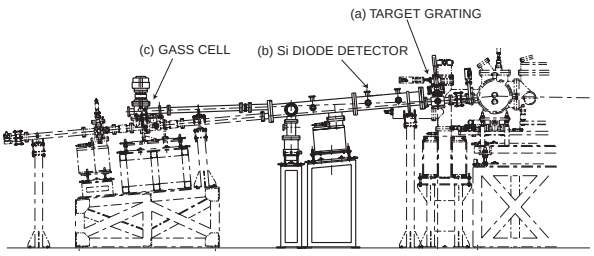

Figure 1. Schematic overview of the endstation at BL4B.