

**DEVELOPMENT OF MEASURING SYSTEM FOR STRESS BY MEANS OF  
IMAGE PLATE FOR SYNCHROTRON RADIATION EXPERIMENT AT PHOTON  
FACTORY (KEK)**

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In order to carry out the stress measurement at the Photon Factory, Tsukuba, Japan, by means of x-ray two-dimensional detector, a new measuring system was developed by the authors. The background and the purpose of the study are as follows. It is possible to carry out the stress measurement using a two dimensional x-ray detectors, and this method has some advantages such as time-consuming and effective use of diffraction data emerged from the material. However, enough studies on the measuring systems for this kind of x-ray stress measurement have not been made, so that both the accuracy and the reliability of the data are not enough level at the present stage. Especially, accuracy of the determination of the exact center of the diffraction ring, flatness of the measuring plane in microscopic level and exact distance between the specimen and the detector, are required in order to be adjusted as correctly as the ordinary x-ray goniometer. In this study, the authors tried to develop the measuring system which is satisfied with the above requirements. The check on the validity of the authors' device was made through the experiment, in which the specimen was loaded under the bending stress during the x-ray stress measurement, and the stresses obtained were compared to the applied ones. An experiment was conducted for beryllium (Be) specimen, which has very small absorption coefficient. Discussion was done on the influence of the penetration depth on the x-ray stress measurement.