A simple method for testing X-ray beam uniformity

A pinhole in a thin piece of lead mounted on a goniometer head can be used to check the uniformity of the X-ray beam on a full-circle diffractometer. Beam uniformity must be carefully checked if a monochromator is being used.

X-ray beam uniformity is sometimes measured with a pinhole probe mounted on a stage with graduated orthogonal x, y motions. We find the following much simpler device entirely satisfactory. It consists of a lead disk about 10 mm in diameter and 0.5 mm thick pierced by a sharp needle to form a hole 0.1 mm or less in diameter. The disk is mounted on a goniometer head and oriented perpendicular to the X-ray beam. The pinhole is then centered in the \( \chi \) circle using the goniometer head adjustments. Beam intensity is measured with the detector at \( 2\theta = 0 \), the beam stop removed and the X-ray beam attenuated.

The position of the pinhole in the beam is varied by translating it horizontally using the goniometer head x motion and rotating the \( \chi \) circle by suitable increments. We find the following settings satisfactory: 0.1 mm offset, \( \Delta \chi = 45^\circ \); 0.2 mm offset, \( \Delta \chi = 30^\circ \); 0.3 mm offset, \( \Delta \chi = 15^\circ \). Intensities are conveniently plotted on polar coordinate paper. Fig. 1 shows contours obtained in this way for an X-ray beam with good horizontal uniformity but further adjustment needed to correct vertical variation.

The advantage of this method is the simplicity of the device required.

P. GALLEN LENHERT

Physics Department
Vanderbilt University
Nashville
TN 37235
USA

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International Union of Crystallography


Commission on Crystallographic Apparatus

IUCr X-ray Attenuation Project

At the International Union of Crystallography Congress which was held in Warsaw in 1978, the Commission on Crystallographic Apparatus decided that there was a need to evaluate the techniques for the measurement of X-ray attenuation coefficients. A committee was set up to organize the project, and planning for the project is now well advanced.

It is the aim of the organizing committee to encourage the participation in the project of laboratories using a diverse range of techniques of measurement. For example, sources of incident X-ray beams which are to be used range from synchro-