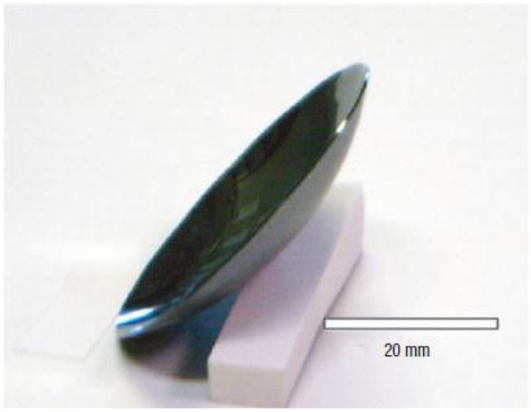
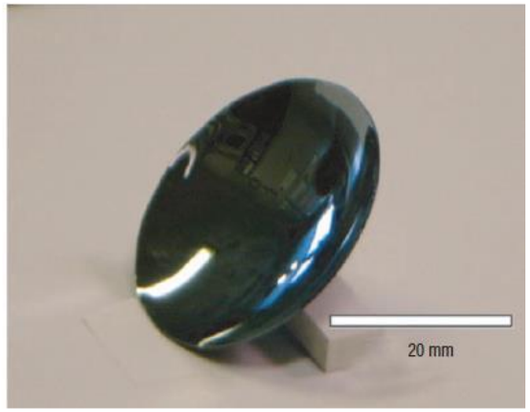
# Tohoku Univ. Technology

## Distributed curvature crystal lens and X-ray reflectance measurement device

**Realization of a distributed curvature crystal lens with high light focusing accuracy!**

**Able to increase X-ray intensity and realize compact device with long life!**



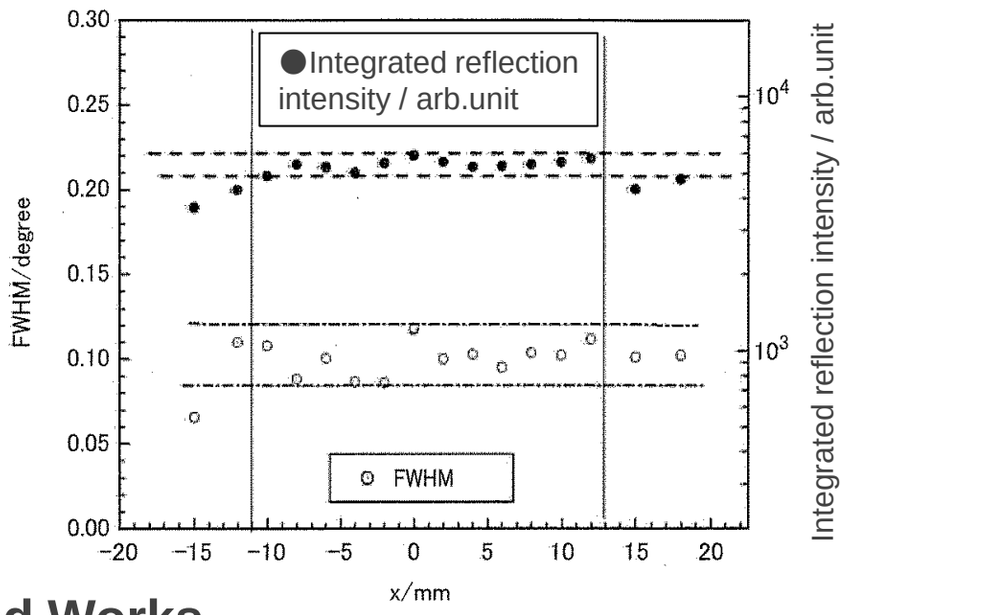

Reference [1]

## Overview

In a conventional X-ray monochromator, the spectroscopic crystal is elastically bent slightly, then polished to obtain a uniform diffraction. However, this method where the crystal is deformed within the elastic limit, **cannot be applied for a large curvature bending**, so it can only be used for a big X-ray device. Moreover, there is also an issue on the deformation stability and aging due to keeping the crystal deformed.

This invention is able to realize a distributed curvature crystal lens with a wide incident angle and high light focusing accuracy. This distributed curvature crystal lens is made by plastic deformation of Ge or Si (110) single crystal plate pressed by a mold at high temperature. The X-ray reflectance measurement system of this invention is equipped with above lens which enables to focus a **wide angle** and **significantly increase X-ray intensity**.

## Able to obtain good uniformity of integrated reflection intensity and full width at half max.




## Product Application

- Distributed curvature crystal lens used for X-ray diffraction, etc.
- Analysis and inspection device such as CT, EPMA, XRF, XRD, XPS, XRC, XRR, etc.
- X-ray telescope, satellite, etc.
- Medical field

## Related Works


[1] K. Nakajima, K. Fujiwara, W. Pan, and H. Okuda, Nature Mater. 4, 47-50 (2005).
[2] H. Okuda, K. Nakajima, K. Fujiwara, and S. Ochiai, J. Appl. Cryst. 39, 443-445 (2006).
[3] H. Hiraka, K. Fujiwara, K. Yamada, K. Morishita, and K. Nakajima, Nuclear Instruments and Methods in Physics Research A 635, 137-140 (2011).
[4] H. Okuda, K. Morishita, K. Nakajima, K. Fujiwara, I. Yonenaga, and S. Ochiai, Appl. Phys. Exp. 3, 046601 (2010).
[5] K. Hayashi, K. Nakajima, K. Fujiwara, and S. Nishikata, Review of Scientific Instruments 79, 033110 (2008).


### IP Data

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| IP No. | : | JP4973960 |
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