

A High Quality Bent Crystal Monochromator based on Asymmetric Laue Geometry

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Using the Monte-Carlo program recently developed by the author, it was found that the rocking curves of neutron and X-ray from a bent mosaic crystal are better in agreement with experiment than those calculated from the one-dimensional layer-coupling model [1], used by Alianelli et al [2]. Moreover, our calculations show that a 67% reflectivity at the peak and 30% larger integrated reflectivity with much better focusing would be achieved if Laue geometry with asymmetric parameter $b < 1$ and optimum thickness [3] were used instead of the symmetric Bragg geometry for the bent neutron monochromator described by [2]. Our program takes into account all the complicate factors during the multiple reflection process and is appropriate for any crystal size, beam width, incident and exit beam angular divergence. It also provides the evaluation of the current density distribution curve under a given rocking angle.

[1] Hu H. -C., *J. Appl. Cryst.*, 1992, **25**, 731. [2] Alianelli L., Sanchez del Rio, Felici R., *J. Appl. Cryst.*, 2004, **37**, 732. [3] Hu H. -C., *Acta Cryst.*, 1997, **A53**, 484.

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