DYNAMICAL THEORY OF X-RAY FOCUSING SPECTROMETERS AND MONOCHROMATORS CURVED TO THE LOGARITHMIC SPIRAL

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Theory of dynamical diffraction of X-radiation by a crystal curved to a logarithmic spiral is developed. An approximate analytical solution of the Takagi-Taupin equations for such a crystal is obtained. Focusing features of a one-dimensionally curved crystal as well as these of a two-dimensionally curved crystal using two-wave approach and geometrical optics are theoretically investigated. The lens-equation for the crystal curved to the logarithmic spiral is derived. Theoretical estimates for spectral and spatial resolution of a focusing spectrometer on the basis of the crystal curved to the logarithmic spiral are calculated.