Angular distribution of X-ray fluorescence under three-beam diffraction condition is investigated using synchrotron radiation for GaAs single-crystals. The fluorescence yield and multiply diffracted intensities as a function of the Bragg angle and the azimuth angle of rotation of a symmetric Bragg primary reflection are measured. It is found that fluorescence yield may increase first then decrease as the azimuth angle moves from the lower angles to higher angles across the exact three-beam diffraction position, or vice versa, depending on the polarization of the incident beam and the triplet phases involving in the diffraction process. However, the corresponding multiple diffraction intensities show almost opposite characteristic to fluorescence. The relationship between fluorescence yield and diffraction intensity is thoroughly examined. A theoretical interpretation, based on the dynamical theory, for the observed behavior is also given.

Keywords: FLUORESCENCE, MULTIPLE-WAVE, DYNAMICAL

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**THEORY OF THE X-RAYS BACKSCATTERING BY THE CURVED CRYSTALS, MULTI-WAVE DIFFRACTION**

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Backscattering of the X-radiation by the crystals with account for the multi-wave diffraction phenomenon is theoretically investigated. The multi-wave focusing of X-Rays scattered in the backward direction is treated. Influence of the temperature on the backscattering is discussed.

Keywords: BACKSCATTERING, X-RAYS, MULTI-WAVE DIFFRACTION