X-RAY *LLL*-INTERFEROMETRY OF CRYSTALS DEFORMED BY A POINT LOAD

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S u m m a r y

The theoretical fundamentals of the moire images of defects in an *LLL*-interferometer are represented. The influence of various factors on forming a moire pattern is determined. The research of regularities and mechanisms of forming X-ray moire images of strain fields under acting a point force on the analyzer of a three-crystal *LLL*-interferometer is carried out. The influence of weak and strong distortions, caused by a point load (prick) on the entrance and exit surfaces of the crystal-analyzer, on forming a moire pattern is investigated. Amplitudes $E_{0,h}$ of wave fields slowly vary in slightly deformed crystals, and the moire pattern formation depends, mainly, on a phase mismatch of the wave fields interfering in the analyzer. The area of the effective interaction of two families of moire fringes — moire fringes caused by a stationary phase shift of interfering waves and deformation fringes — depends on crystal thickness as well as on acting force. Thickness transformation of moire patterns of the crystal-analyzer is caused by a change of the ratio between structural and deformation composite phases. There is a satisfactory qualitative and quantitative agreement between the calculated and experimental thickness intensity distributions in the area of strong strains as well as in the area of weak strains. The received results show an opportunity of three-crystal X-ray interferometry for the investigations of a new diffraction effect, and finding a correlation between the parameters of a diffraction pattern and structural perfection of researched crystals.