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Mathematical Modelling of X-ray Dynamical Diffraction by Non-Stationary Deformed Crystals

The system of differential equations describing X-ray dynamical diffraction by non-stationary deformed crystals was obtained in Ref. This is a system of many-dimensional first-order differential equations of hyperbolic type with complex time-dependent coefficients. Its considerable modification is presented. Efficient finite-difference scheme based on the many-component modification of the alternate directions method is proposed. Numerical calculations show that even small non-stationary crystal deformations lead to considerable changes in the diffraction pattern. So, mathematical model and numerical method presented can be used in mathematical modelling of intensive beams passing through crystals.

Reference: A. O. Grubich, S. N. Sytova, X-ray scattering by non-stationary crystal, *Izv. Akad. Nauk of Belarus, ser. phys. -math.* **No. 3** (1993), 90–94.