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PS2-27: Laue Lenses for Hard X-rays with Controllable Parameters

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In the works [1] it was first observed that the phenomenon of the full pumping of X-rays from transmitted direction to the reflection direction in single quartz crystals in the Laue geometry under the influence of the temperature gradient or acoustic vibrations. In work [2] it is shown that the angular width of the full pumping radiation is directly proportional to the thickness of the sample. One of the important processes in the control of X-rays parameters in space and time is its focus. The papers [3] experimentally and theoretically show that with the help of acoustic field and temperature gradient it is possible to control the location of the focus of the diffracted beam in space and time, as well as convert a spherical wave into a plane wave.

In order to obtain monochromators and with the controllable parameters in the range of hard X-rays (30-200 Kev) we study the X-ray diffraction in the Laue geometry for white beams in single quartz crystals under the influences of the temperature gradient and acoustic vibrations. The high controllability of monochromaticity, intensity and focal length of the parameters of hard X-rays is shown.

References

[1] A.R. Mkrtychyan, M.A. Navasardian, V.K. Mirzoyan 1982, JETP Letters, Vol. 8, No. 11, 677-680, A.R. Mkrtychyan, M.A. Navasardian, R.G. Gabrielyan and etc. 1983, JETP Letters, Vol. 9, No. 11, 1181. [2] S.N. Noreyan, V.K. Mirzoyan, V.R. Kocharyan 2004, Izvestia NAN Armenii, Fizika, , Vol. 39, No. 2, 124-130. [3] A.R. Mkrtychyan, M.A. Navasardian, R.G. Gabrielyan, L.A. Kocharian and R.N. Kuzmin, Solid State Communications , V. 59, 147-149, 1986, A.R. Mkrtychyan, R.G. Gabrielyan, H.A. Aslanyan, A.H. Mkrtychyan, Kh.V. Kotandzhyan, Izvestiya NAN Armenii, Fizika, Vol. 21, No. 6, 297-305, 1986.

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