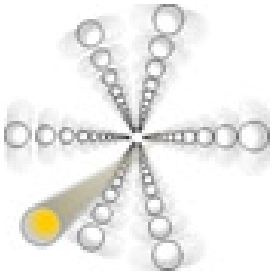

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Monochromatization of Diffracted Neutrons by the Acoustic Superlattice

In the work [1], for the first time the phenomena of transition of thermal neutrons from transmission to the reflection direction has been experimental obtained. The phenomena investigated for the neutrons diffracted on atomic planes of quartz single crystal under the influence of temperature gradient.
In this work the results of investigations of thermal neutrons scattering on quartz single crystal in Laue geometry under the influence of temperature gradient or acoustic waves created superlattice are represented.
As a source of neutrons the plutonium-239-berillium tablets are used with a paraffin moderator in form of 10 mm diameter discs
Experiments carried out for thermal neutrons without external influences point out that the diffracted neutrons energy distribution has an asymmetric form and becomes symmetric at the presence of external influences, i.e. the monocromatization effect observed.
Meantime, experiments pointed out, that for increasing temperature gradient or amplitude of acoustic vibrations the intensity of diffracted neutrons bunch increases up to maximal value, and after that decreases with increasing of governing parameters of external influences.
Experimental and theoretical results are in agreement.

References

1. A.R. Mkrtchyan, L.A. Kocharyan, M.A. Navasardyan at all. Journal of Contemporary Physics Arm SSR, vol..21, iss. 5, (1986) 287-289, (in russian).

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