INFLUENCE OF ULTRASONIC TREATMENT ON ELECTROPHYSICAL PROPERTIES OF HgMnTe AND HgCdMnTe SINGLE CRYSTALS

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S u m m a r y

The results of experimental and theoretical studies of how the ultrasonic (US) treatment (UST) and ultrasonic loading (USL) influence HgMnTe and HgCdMnTe semiconductor crystals are reported. It has been demonstrated that the acoustically stimulated changes of electrophysical parameters, namely, (i) an increase of the Hall coefficient $R_{\rm H}$ in specimens with conductivity of the n-type and its reduction in specimens of the p-type and (ii) an increase of the Hall mobility $\mu_{\rm H}$ at high temperatures and its reduction at low ones in specimens of both the n- and p-types are governed (a) by the initial structure of defects in crystals; in particular, an increase of the mercury content results in a reduction of the amplitude threshold of ultrasonic influence; (b) by relations among the contributions made by various mechanisms of current carrier scattering, the most effective US influence being exerted through the mechanism of scattering by ionized impurities; and (c) by the UST parameters such as frequency, intensity, and duration.