Nonstationary Heat field as a new Approach in Bridgman Crystal Growth

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A traditional and axiomatic approach in crystal growth is the creation of a stable and stationary heat field with desired axial and radial temperature gradients. However, an obvious progress in application of Heat Field Rotation Method [1] is reached by development of the non-linear crystal growth technologies of β-BaB_2O_4 (BBO) in Czochralski configuration, LiB_3O_5 (LBO) and $CsLiB_6O_{10}$ (CLBO) in Kyropulos method.

The experiments of $AgGaS_2$ crystal growth by Bridgman method were performed using modified furnace which allows to create cyclic temperature oscillations. Obtained results suggests that moderate temperature oscillations (up to 4°C) favor the crystal quality and are likely to affect generally the hydrodynamic situation in the melt according to Curie principle. More complete mixing resulted to the crystals free of crack, twins and inclusions. Such defects often accompany crystals grown in stationary heat field where the mixing generated by natural convection is slowed due to "stabilized" axial temperature distribution in the melt.

[1] Kokh A.E., Popov V.N., Mokrushnikov P.W., *J. Crystal Growth*, 2001, **230**, 1-2, 163.

Keywords: crystal growth apparatus design, convection, nonlinear optical materials