Development of large-size LBO crystal growth

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Lithium triborate (LiB₃O₅, LBO) crystal used to be grown by the Top-Seeded Solution Growth method (TSSG). Due to the high viscosity of the solution, the rate of LBO crystal growth with this method has to be very slow with careful control to avoid spontaneous nucleation. On bases of the TSSG method, we adopted a new solute transport technique as well as a new fluxes system to grow LBO crystals. The largest LBO single crystal reported in the world with the size of 240×160×110 mm³ and the weight of 3780g was successfully grown along the phase-matching angle Direction in 180 days. LBO device with the size of 150x150x10mm3 can be obtained. In the near future, large size LBO crystal will play an active role in the progress of large-aperture, high-energy, high-power laser techniques.