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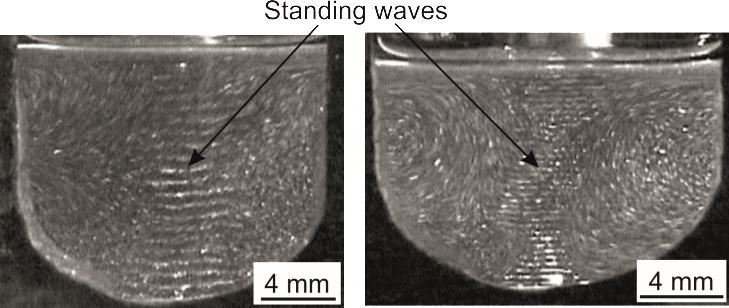
Supplementary information

**Growth of Bi and Bi1-xSbx single crystals with specific properties**

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**Elimination of the growth striations in Bi1-xSbx single crystals**

It is known that the growth striations in growing semiconductor single crystals appear due to convective temperature fluctuations in the melt.1,2 It was demonstrated that the formation of standing waves between the crucible bottom and the solid-liquid interface suppresses convection in the melt and eliminates growth striations in single crystals(manuscript, Fig. 2b).3 Radiation pressure in ultrasonic standing waves displaces small particles to antinodes, where its oscillate (Fig. 1Sa and 1Sb). Therefore, the melt flow of convection cannot move in the standing wave channel and transport dopants near the S/L interface. Such behavior of standing waves was found in the melts with a steady convection at the Rayleigh number less than 2 × 105.3 In our experiments with ultrasound effect, Bi1-xSbx single crystals were pulled from the melt at the Rayleigh number of 24 that confirms a steady convection.



**Fig. 1S** (c) Photo image a standing wave channel in water with 10% glycerol and textolite particles at 0.69 MHz. (d) Photo image a standing wave channel in water with 10% glycerol and textolite particles at 1.44 MHz.

The ultrasound at frequencies of 0.65, 2.5 or 5 MHz formed standing waves under the S/L interface in the melt and eliminated Sb striations in Bi1-xSbx single crystals.4 Ultrasound was introduced into the melt from a piezo transducer through a fused silica waveguide, with 10 mm diameter and 300 mm length, fused to the bottom of the silica crucible. The direction of ultrasonic waves was parallel to the pulling axis. Each pulled Bi0.95Sb0.05 single crystals with 10 mm diameter had four regions of 4 mm in length, two of which were pulled with rotation rates of 1.5 and 2.0 rpm with ultrasound and two at the same rotation rates without ultrasound. No striations were found in single crystals grown with constant diameter at effect of ultrasound. However, the striations appeared when the diameter was changed. In the low part of the crystals grown with the same rotation rates after ultrasound switching off the striations do not reappeared until 2 h have passed. This phenomenon correlates to the small diffusion coefficient of Bi (1.6×10-5 cm2 s-1) and high dynamic viscosity (1.7×10-3 Pa s) in Bi-Sb melts, which slows down the recovery of convection.

**Notes and references**

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