

# Rapid report of Hicari experiments (Growth of Homogeneous SiGe Crystals in Microgravity by the TLZ method)

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Objectives: Evaluation of a new crystal growth method named the Traveling Liquidus Zone (TLZ) method in microgravity. Grown  $\text{Si}_{0.5}\text{Ge}_{0.5}$  crystals will offer basic data for growing homogeneous large diameter SiGe crystals on the ground.

- ✓ First Hicari experiment (Hicari#1), devoted to refining the #2, #3 and #4 temperature profiles, carried out from 1<sup>st</sup> to 5<sup>th</sup> Mar. 2013. The Hicari#1 cartridge shown in photo 1 returned on 25<sup>th</sup> March 2013.
- ✓ Photo 2 shows the outer view of a space-grown Hicari#1 SiGe crystal. There were no major cracks on the SiGe surface and no voids observed by the X-ray CT observations. Thus Hicari#1 operations in space and on the ground were successful.
- ✓ Growth length and compositional profiles of #1 crystal were consistent with our expectation. Radial compositional homogeneity is better than that predicted by our 2D TLZ model.
- ✓ Hicari#2 experiment carried out in the ISS from 23<sup>rd</sup> to 27<sup>th</sup> July 2013. The #2 cartridge will be returned on the ground in Nov., 2013 by Soyuz 35.
- ✓ Hicari#1 rapid report will be submitted to the Journal of Crystal Growth.

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Photo1. Hicari#1 returned cartridge

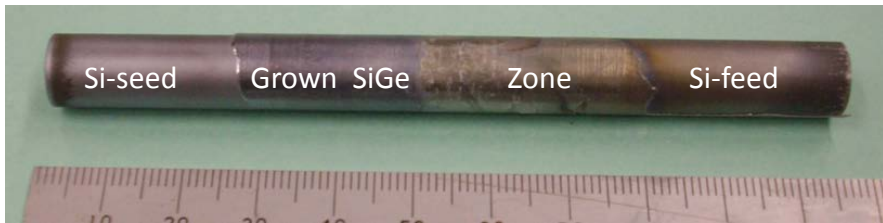


Photo2. Outer view of a space-grown Hicari#1 SiGe crystal