

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Diameter Control of HP-Ge Crystal Growth HAO MEI, Univ of South Dakota — Large single crystals of germanium are being grown using the Czochralski technique, in which a precisely cut seed crystal is dipped into the molten germanium and then withdrawn slowly, while maintaining the temperature of the melt just above the freezing point. Typically the seed is rotated while the crystal is being formed. The resulting crystal is typically oriented with a (100) crystal axis parallel to the growth direction. The crystal growth process is conducted in a hydrogen (H_2) atmosphere, with the H_2 flowing inside a quartz envelope. High purity germanium (HP-Ge) crystals with diameter 3 ~ 9 cm are grown on weekly basis at university of South Dakota. As Czochralski growth is a dynamic process, the thermal geometry in the furnace undergoes a considerable change during the crystal growth process. A load cell was introduced to control the crystal growth process. Growing crystals with automation system is studied. In order to grow crystal automatically, the relationship between input power and crystal weight or crystal diameter is investigated. We show that HP-Ge crystal growth could be controlled automatically using software with feedback system.

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Date submitted: 27 Nov 2012

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