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Dislocation distribution in large high-purity germanium crystal[1]
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We investigated the impacts of growth rate, time-temperature profile, thermal gradient on the dislocation distribution in large high-purity germanium crystal (12 cm in diameter) grown via Czochralski along <100>orientation. The time-temperature profiles of the crystal grown at different input power were investigated using direct measurements and computational modeling. The effect of crystallization speed on dislocation density is discussed from the context of thermal gradient during growth. Several samples from the grown crystals were used for this investigation. We measured dislocation density across the entire cross-section of the grown crystal through the microscope. By measuring and calculating the dislocation density, we were able to identify the denseness and the type of dislocation, which allows us to study how the thermal stress impacts the dislocation generation and distribution across the large grown crystals.

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