Shuttle Mission Sts-50: Orbital Processing of High-Quality Cdte Compound Semiconductors Experiment: Final Flight Sample Characterization Repor

By David J. Larson

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 182 pages. Dimensions: 9.7in. x 7.4in. x 0.4in.The Orbital Processing of High-Quality Doped and Alloyed CdTe Compound Semiconductors program was initiated to investigate, quantitatively, the influences of gravitationally dependent phenomena on the growth and quality of bulk compound semiconductors. The objective was to improve crystal quality (both structural and compositional) and to better understand and control the variables within the crystal growth production process. The empirical effort entailed the development of a terrestrial (one-g) experiment baseline for quantitative comparison with microgravity (mu-g) results. This effort was supported by the development of high-fidelity process models of heat transfer, fluid flow and solute redistribution, and thermo-mechanical stress occurring in the furnace, safety cartridge, ampoule, and crystal throughout the melting, seeding, crystal growth, and post-solidification processing. In addition, the sensitivity of the orbital experiments was analyzed with respect to the residual microgravity (mu-g) environment, both steady state and g-jitter. CdZnTe crystals were grown in one-g and in mu-g. Crystals processed terrestrially were grown at the NASA Ground Control Experiments Laboratory (GCEL) and at Grumman Aerospace Corporation (now Northrop Grumman