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AHP Setup for Low Laminar Melt Flow Study in Crystal Growth

Michael A. Gonik(1), Janusz A. Szymczyk(2), Tomasz A. Kowalewski(3)

(1) *Dept. of Crystal Growth, Alexandrov, Russia*
(2) *University of Applied Sciences, Stralsund, Germany*
(3) *IPPT PAN, Warszawa, Poland*

For verification of numeric methods and development of experimental benchmarks for 2D and 3D models of heat and mass transfer in crystal growth, the experimental setup is designed. A novel AHP method of crystal growth, which makes possible to grow crystal from the thin melt layer employing submerged AHP-heater, was based on this setup. Laminar character of the flow and available data on temperature over all boundaries of melt-crystal system allows performing accurate computations. The setup is made for conducting experiments in crystal growth of NaNO3 and ice, and equipped with PIV and PVT visualizations systems to provide finding flow velocity field and temperature distribution in the fluid. Preliminary investigations conducted for NaNO3 solidification have shown good coincidence of calculated data on convection with those observed in the experiment, as well as possibility to suppress the natural convection and to create low laminar melt flow similar to micro gravity conditions

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