عنوان مقاله:

Transition from Steady to Oscillatory Flow Natural Convection of Low-Pr Fluids in ۳D Bridgman Configuration for Crystal Growth

محل انتشار:

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خلاصه مقاله:

A numerical study of the transition from steady to oscillatory flow natural convection of low- Prandtl number fluids inside the ۳D Bridgman configuration has been carried out. The three-dimensional Navier-Stokes and energy equations, with the Boussinesq approximation have been discretized by means of a finite volume procedure which employs a second order accurate central difference scheme to treat diffusive and convective fluxes. In natural convection, the buoyancy force is only driving the flow and its intensity can be move a harmful effect on the crystal growth, such as the striation. Naturally, the steady state flow is obtained for low Rayleigh number and shows a great dependence between the Rayleigh number, the flow structure and the heat transfer rate. A low increase in the Rayleigh number we guide to determine the critical point in which the ۳D flow became oscillatory. This regime appears by a sinusoidal signal in the time and developed in each period of time.

کلمات کلیدی:

۳D Natural convection, oscillatory flow, Steady, Low, Pr fluid, Numerical study