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Convection Effects in Three-Dimensional Dendritic Growth

Steady forced convection in periodically developed low Reynolds number ($10 \leq Re \leq 1000$) air ($Pr = 0.7$) flows in three-dimensional wavy-plate-fin cores is

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considered. Constant property computational solutions are obtained using finite-volume techniques for a non-orthogonal non-staggered grid.

Three-dimensional convection of an infinite-Prandtl-number ...

Three-dimensional numerical simulations were conducted for the natural

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convection phenomena around a hot inner circular cylinder positioned in a cold cubic enclosure in the Rayleigh number range of $10^3 \leq Ra \leq 10^6$ at the Prandtl number of $Pr = 0.7$. The immersed boundary method (IBM) was used to capture the virtual wall boundary of the inner cylinder, based on the finite volume method (FVM).

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Natural Convection Effects in Three-Dimensional Window ...

Abstract. A phase-field model is developed to simulate free dendritic growth coupled with fluid flow for a pure material in three dimensions. The preliminary results presented here illustrate the strong influence of

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convection on the three-dimensional (3D) dendrite growth morphology.

Low Reynolds number forced convection in three-dimensional ...

The effect of non-linear convection in a laminar three-dimensional Oldroyd-B fluid flow is addressed. The heat transfer phenomenon is explored by considering

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the non-linear thermal radiation and heat generation/absorption. The boundary layer assumptions are taken into account to govern the mathematical model of the flow analysis.

Viscous and adiabatic heating effects in three-dimensional ...

A three-dimensional direct numerical

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simulation (using a fully spectral method) of compressible convection of an infinite Prandtl number fluid in a wide box with dimensions $5 \times 5 \times 1$ was conducted. Depth-dependent viscosity, thermal expansivity, and thermal conductivity have been included in order to model deep-seated processes in the Earth's mantle.

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Three-Dimensional Mixed Convection Flow of Viscoelastic ...

A numerical investigation is made of the effects compressibility on three-dimensional thermal convection in a basally heated, highly viscous fluid spherical shell with an inner to outer radius ratio of approximately 0.55,

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characteristic of the Earth's whole mantle. Compressibility is implemented with the anelastic approxi-

Viscous and adiabatic heating effects in three-dimensional ...

Three-dimensional mixed convection flow of viscoelastic fluid over an exponentially stretching surface is

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analyzed in this study. The analysis is carried out in the presence of thermal radiation subject to convective boundary conditions. The main observations can be summarized as follows:

On the stabilizing effect of convection in three ...

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DIMENSIONAL DENDRITIC GROWTH Yili Lu¹, C. Beckermann^{1*}, and A. Karma²
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On non-Oberbeck-Boussinesq effects in three-dimensional ...

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Convection Effects in Three-Dimensional Dendritic Growth ...

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Rayleigh-Bénard convection in glycerol (Prandtl number $\text{Pr} = 2547.9$) in a cylindrical cell with an aspect ratio of $\Gamma = 1$ was studied by means of three-dimensional direct numerical simulations (DNS). For that purpose, we implemented temperature-dependent material properties into our DNS code, by prescribing polynomial functions up

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to seventh order for the viscosity, the ...

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Convection Effects in Three-Dimensional
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Iowa, Iowa City, IA 52242-1527, U.S.A.
2Department of Physics and Center for
Interdisciplinary Research on Complex
Systems, Northeastern University,
Boston, MA 02115, U.S.A. ABSTRACT

**Natural convection effects in three-
dimensional window ...**

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The stabilizing effect of convection has been also used in deriving localized nonblowup criteria for the three-dimensional incompressible Euler equations by Deng, Hou, and Yu in [10, 11]. By using a Lagrangian formulation and exploiting the connection between vortex stretching and the local geometric regularity

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Nonlinear three-dimensional stretched flow of an Oldroyd-B ...

A three-dimensional direct numerical simulation (using a fully spectral method) of compressible convection of an infinite Prandtl number fluid in a wide box with dimensions $5 \times 5 \times 1$ was conducted. Depth-dependent viscosity,

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thermal expansivity, and thermal conductivity have been included in order to model deep-seated processes in the Earth's mantle.

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**CONVECTION EFFECTS IN THREE-
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results presented here illustrate the strong influence of convection on the three-dimensional (3D) dendrite growth morphology.

On the Stabilizing Effect of Convection in Three ...

This paper studies three-dimensional natural convection effects in window

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frames with internal cavities. Infrared (IR) thermography experiments, computational fluid dynamics (CFD) simulations, and calculations with traditional software for simulating two-dimensional heat conduction were conducted.

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DIMENSIONAL DENDRITIC GROWTH

The preliminary results presented here illustrate the strong influence of convection on the three-dimensional (3D) dendrite growth morphology. The detailed knowledge of the flow and temperature fields in the melt around the dendrite from the simulations allows for a detailed understanding of the

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convection effects on dendritic growth.

Convection Effects in Three-Dimensional Dendritic Growth ...

We investigate the stabilizing effect of convection in three-dimensional incompressible Euler and Navier-Stokes equations. The convection term is the main source of nonlinearity for these

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equations. It is often considered destabilizing although it conserves energy due to the incompressibility condition.

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