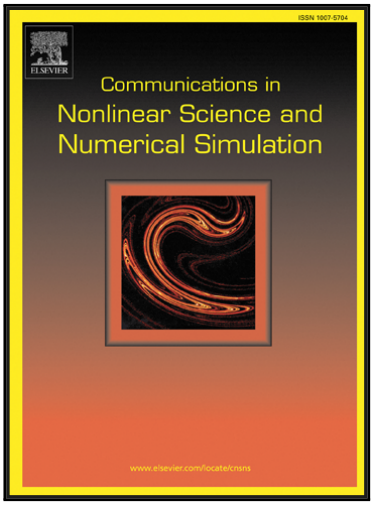

Exploring atmospheric convection with physically sound nonlinear low-order models

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Highlights

- A 3D low-order model of Rayleigh-Bénard convection with shear is developed
- The model exemplifies efficient nonlinear low-order models for fluid dynamics
- The model is used to study convection patterns (cells vs. rolls) in the atmosphere
- Its stationary solutions prove comparable with atmospheric observations
- Under constant moderate buoyancy, the convection patterns are controlled by shear.