Global regularity of 3D tropical climate model with fractional diffusion and nonlinear damping

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Abstract

This paper investigates the three dimensional tropic climate equations with fractional diffusion and nonlinear damping. The global existence and unique strong solutions of the tropic climate equations have been build under the assumption that initial data $(u_0, v_0, \theta_0) \in H^1(\mathbb{R}^3) \times H^1(\mathbb{R}^3) \times H^1(\mathbb{R}^3)$ with $\alpha > 1$, $\max(1, \frac{p+4}{2p}) < \beta$, $\gamma < 1 + \frac{3}{p+1}$ and $p, q > 3$.

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