

# EXISTENCE OF AN INVARIANT MEASURE FOR THE KICK-FORCED PRIMITIVE EQUATIONS WITH PHYSICAL BOUNDARY CONDITIONS

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The 3-dimensional primitive equations are a variant of the 3-dimensional Navier-Stokes equations in which the equation for the third component of velocity is removed and we make the assumption that the pressure is independent of the third space coordinate. In particular, we consider the physically realistic “physical boundary conditions”.

Although more computationally messy, the primitive equations hold some advantages over the Navier-Stokes equations: While the uniqueness of weak solutions (i.e. in  $L^2$ ) remains open, the global existence of strong solutions (i.e. in  $H^1$ ) is known.

We show that there exists (in  $H^1$ ) an invariant measure to the primitive equations with kick-forcing. The structure of the primitive equations makes  $H^a$ -norm estimates very difficult for  $a > 1$ . We instead use a more subtle compactness argument introduced by Ning Ju.