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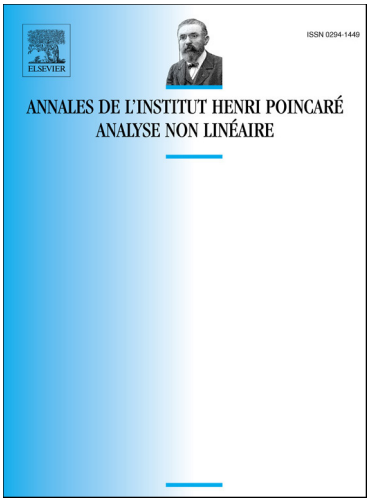

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On the Attractor for the Semi-Dissipative Boussinesq Equations

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Abstract

In this article, we study the long time behavior of solutions of a variant of the Boussinesq system in which the equation for the velocity is parabolic while the equation for the temperature is hyperbolic. We prove that the system has a global attractor which retains some of the properties of the global attractors for the 2D and 3D Navier-Stokes equations. Moreover, this attractor contains infinitely many invariant manifolds in which several universal properties of the Batchelor, Kraichnan, Leith theory of turbulence are potentially present.
Résumé. Dans cet article nous étudions le comportment en temps long infini des solutions d'un système du Boussinesq partiellement dissipatif, dont une est parabolique et l'autre est hyperbolique. Dans ce but, nous introduisons un attracteur universel qui retient plusieurs proprietés des attracteurs universels des équations de Navier-Stokes en dimension deux ou trois, qui, in particulier, contient une infinité de varietés invariantes dans lesquelles plusieurs proprietés universelles de la théorie de la turbulence bidimensionnelle de Batchelor, Kraichnan et Leith, sont potentiellement présentes.

Keywords: Boussinesq equations, global attractor, semi-dissipative system, Navier-Stokes equations, turbulence
2000 MSC: 35B41, 35K51, 35K55, 35Q30, 35Q35, 35Q86, 76D09, 76F05, 76F25

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