ON THE NONLINEAR STABILITY FOR QUASI-GEOSTROPHIC FORCED ZONAL FLOWS[*]

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Dedicated to Dr. Dan Tiba on the occasion of his 70th anniversary

Abstract

This paper continues a series of studies providing stability criteria for quasigeostrophic forced zonal flows in in the presence of lateral diffusion and bottom dissipation of the vertical vorticity. We study the Lyapunov stability of a stationary and longitude independent basic flow, obtaining linear and nonlinear stability criteria expressed in terms of the maximum shear of the basic flow and/or its meridional derivative, extending some previous results.

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1 Introduction

In dynamic meteorology the large-scale atmospheric motions are characterized by many parameters presenting large spatial variations in the vertical direction. For this reason, we limit our considerations to only a part of

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