Geophysical Research Abstracts,
Vol. 11, EGU2009-12474, 2009
EGU General Assembly 2009

Anomalous scaling and stratification

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In this work we intend to show the relationship in the atmosphere between homogeneity and instability, as well as between stability and 2D turbulence. On the other hand, 2D turbulence is characterized by the absence of intermittency. 3D turbulence, in conditions of strong stability or rotation, presents a formal analogy with 2D turbulence. In this sense, this study shows the relationship between the degree of intermittency, in 3D situations, and the type of stratification that different atmospheric situations show along a study period. The temporal evolution of this stratification presents a very clear cycle along the 24 hours of the day, which is reflected in a decrease of intermittency at nocturnal hours and an increase at diurnal hours. In order to characterize this intermittency, we have used two procedures. Firstly, the curvature of the evolution of the structure functions scaling exponents with the order of those functions (a greater concavity represents a higher intermittency). To characterize this curvature, the coefficient of the quadratic term of the corresponding function has been used. Secondly, the multifractal spectrum (a wider concave spectrum implies also higher levels of intermittency). In 2D atmospheric situations, we show that this evolution of the scaling exponents (and the correspondent spectra) presents a convex form because of the inhomogeneity showed in stability conditions.