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Similarity scales in the stable boundary layer: a test against data.

F. Tampieri (1), C. Yagüe (2), and S. Viana (3)

(1) CNR, ISAC, Bologna, Italy (f.tampieri@isac.cnr.it, +390516399658), (2) Universidad Complutense de Madrid, Facultad de CC. Fisicas, Dpto Geofisica y Meteorologia, Madrid, Spain, (3) AEMET, Barcelona, Spain

Turbulence in the stable boundary layer is affected by local conditions (surface fluxes and the thermal and dynamic structure of the atmosphere) as well as by non local effects like gravity waves or horizontal inhomogeneities.

In the perspective of a local description, different similarity scales have been proposed in the literature, and summarised for instance by Sorbjan (QJRMS, 2010).

Using first and second order moments of velocity and temperature data obtained during the SABLES98 campaign (Cuxart et al., BLM, 2000) different formulations have been compared to explore the range of applicability and possible shortcomings.

The main results concern the range of Richardson numbers, the equivalence of the different formulations in the moderate stability range and some extensions to large stability conditions.