Theor. Appl. Climatol. 80, 79 (2005)
DOI 10.1007/s00704-004-0091-2

Theoretical and Applied Climatology
Printed in Austria

Editorial: Surface fluxes over land in complex terrain

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For over a decade, studies of land-atmosphere fluxes have been designated as special meetings of the General Assemblies of the European Geophysical Society (EGS). This is a testimony to the growing importance of this issue in science. An earlier special issue on this subject was reported in 1999 (Theor. Appl. Climatol., issue 62). The first unified conference of EGS, EGU (European Union of Geosciences) and AGU (American Geophysical Union) held at Nice on 6–11 April, 2003, provided an opportunity to publish selected papers of the 74 oral and poster presentations of the AS2 session on the subject of land surface fluxes, including those in complex terrain. This particular meeting included both experimental and modeling studies from a variety of ecosystems, which ranged from point to landscape to regional scales. Both basic and applied approaches were represented.

This issue covers a wide range of issues related to surface fluxes. The first paper by Sodemann and Foken (pp. 81–89) is a study of interesting observations of local temperature profiles in Antarctica. The second by Thomas and Foken (pp. 91–104) describes a tool to detect coherent structures in complex terrain. Reth et al. (pp. 105–120) present a study about the comparison of fluxes measured with a chamber vs. the eddy-covariance method. An analysis of carbon dioxide flux measurements at about 20 European FLUXNET measuring sites is presented by Rebmann et al. (pp. 121–141). The role of advection in flux measurements over irrigated fields is discussed by DeBruin et al. (pp. 143–152) and a simulation of evapotranspiration in semiarid regions is presented by Hübener et al. (pp. 153–167). A new numerical approach for footprint modelling at different scales is presented by Sogachev et al. (pp. 169–185). The interaction of carbon fluxes and land use management of grasslands is discussed by Rogiers et al. (pp. 187–203). A method to estimate day-time turbulent diffusivities over complex terrain with standard weather data is presented by Antonacci and Tubino (pp. 205–212), and Ek and Holtslag (pp. 213–227) evaluate a land surface schema with the Cabauw tower data. A modelling study by Stöckli and Vidale (pp. 229–243) examined the inclusion of canopy air storage in predictions of seasonal water and heat exchange at European FLUXNET sites. The same authors (Vidale and Stöckli) also evaluated several land-atmosphere models using data from various European FLUXNET sites (pp. 245–257). Finally a regional study of the variation of surface heat fluxes over the Tibetan Plateau is presented by Ma et al. (pp. 259–273).

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