EMS Annual Meeting Abstracts
Vol. 9, EMS2012-438, 2012
12th EMS / 9th ECAC
© Author(s) 2012

Diagnosis of soil and surface layer parameterizations in BOLAM

O. Drofa, F. Tampieri, P. Malguzzi, and A. Buzzi
CNR ISAC, Bologna, Italy (o.drofa@isac.cnr.it)

BOLAM (Buzzi et al., 2003) is a limited area model which includes an original soil scheme that computes heat and water vertical transfer and vegetation effects, including a treatment of freezing and melting processes. The boundary layer is represented with a TKE scheme (Zampieri et al., 2005) where the surface layer is modeled accordingly to the classical Monin-Obukhov similarity theory.

Observations of boundary layer profiles of mean velocity, temperature and relative
humidity, of surface turbulent kinetic energy and fluxes and of soil temperature and water content are compared with model output for some case studies. The data refer to San Pietro Capofiume, a site in the Po Valley, Italy, and to Cabauw, in the Netherlands.

Combining first and second order moments, the consistency of the parameterisations used for the surface layer is tested against the data, with special concern to stable conditions. Because of the critical dependence of the surface temperature from the soil representation, heat flux and temperature in the soil are also taken in consideration, in order to give a first assessment of their influence.

Buzzi A., M. D'Isidoro, S. Davolio, A case-study of an orographic cyclone south of the Alps during MAP SOP. Q.J.Roy.Meteorol.Soc., 129, 1795-1818, 2003.

Zampieri M., P. Malguzzi, A. Buzzi, Sensitivity of quantitative precipitation forecasts to boundary layer parameterization: a flash flood case study in the Western Mediterranean. Nat. Hazards Earth Syst. Sci., 5, 603-612, 2005.