EMS Annual Meeting Abstracts
Vol. 10, EMS2013-68, 2013
13th EMS / 11th ECAM


# Helsinki's Urban Boundary-layer Atmosphere Network (Helsinki UrBAN)

C.R. Wood (1), L. Järvi (2), R.D. Kouznetsov (1,3), A. Nordbo (2), S. Joffre (1), A. Drebs (1), A. Hirsikko (1,4), C. Fortelius (1), E.J. O'Connor (1,5), S. Haapanala (2), A. Karppinen (1), T. Vesala (2), and J. Kukkonen (1)

(1) Finnish Meteorological Institute, Finland (curtis.wood@fmi.fi), (2) Department of Physics, University of Helsinki, Finland (leena.jarvi@helsinki.fi), (3) Obukhov Institute of Atmospheric Physics, Pyzhevski per. 3 119017 Moscow, Russia (rostislav.kouznetsov@fmi.fi), (4) Forschungszentrum Jülich GmbH, Institut für Energie-und Klimaforschung: Troposphäre (IEK-8), Jülich, Germany, (5) Department of Meteorology, University of Reading, RG6 6BB, Reading, United Kingdom

Helsinki UrBAN (Urban Boundary-layer Atmosphere Network, http://urban.fmi.fi) is a dedicated research-grade observational network for the study of the physical processes in the atmosphere above the city. Helsinki UrBAN is the world's most poleward intensive urban research observation network and thus will allow studying some unique features such as strong seasonality. The network's key purpose is for understanding the physical processes in the urban boundary layer, and associated fluxes of heat, momentum, moisture, and other gases. A further purpose is to secure a research-grade database, which can be used internationally to validate and develop numerical models of air quality and weather prediction. Some equipment have been running since 2005, but there was substantial expansion of the network 2009-2013. We focus on the use of scintillometers, a scanning Doppler lidar, ceilometers, a sodar, eddy-covariance stations, and radiometers. Results examples include (i) frequent observations of negative sensible heat fluxes at the top of the roughness sublayer, (ii) the comparison of scintillometer data with sonic anemometry above an urban surface, (iii) the application of scanning lidar over a city, (iv) combination of sodar and lidar to give a fuller range of sampling heights for boundary-layer profiling, (v) analysis of several years' $CO_2$ fluxes, and (vi) the exploitation of morphological/laser datasets to estimate roughness length and displacement height.