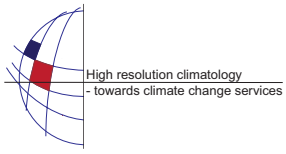
EMS Annual Meeting Abstracts
Vol. 7, EMS2010-434, 2010
10th EMS / 8th ECAC



Comparative analysis of humidity characteristics for open-sea and coastal areas in the Mediterranean

L. Velea (1,2), T. Chronis (1), E. Anagnostou (1,3), and A. Papadopoulos (1)

(1) Hellenic Centre For Marine Research, Anavyssos, Greece , (2) National Meteorological Administration, Bucharest, Romania, (3) University of Connecticut, Civil and Environmental Engineering, Storrs, USA

As a first step toward developing a database of water vapor and temperature profiles relevant for the Mediterranean, we use observational data to examine the characteristics of open-sea areas in this region with respect to water vapor variability. Datasets of vertical distribution of water vapor available from coastal radiosoundings and from satellite-derived products are analyzed, aiming to identify possible regional features as well as to study the representativity of coastal radiosoundings for the open-sea conditions.
We use the water vapor mixing ratio vertical profiles obtained from IASI (Infrared Atmospheric Sounding Interferometer) Level2 product as relevant for the open-sea area, employing data for January -December 2009 (about 19000 profiles per month, with a vertical grid of 100 fixed levels in the pressure range from 1100 hPa to 0.016 hPa), freely available from http://www.class.ncdc.noaa.gov. The coastal radiosounding data is provided by measurements at 17 coastal stations in the Mediterranean, for periods of about 30 years (1980-to present), available from IGRA (Integrated Global Radiosonde Archive) http://www.ncdc.noaa.gov/oa/climate/igra/index.php
Statistical characteristics of surface water vapor mixing ratio, as well as for other humidity quantities (integrated water vapor, mean tropospheric humidity) at monthly and seasonal timescales are derived for data from both sources. The direct comparison is complemented by analyzing the performance of a multilinear regression model relating surface water vapor mixing ratio to integrated measures of humidity, as derived from IASI data, when applied to time-series from the coastal stations.