



## **Variability of middle-upper tropospheric precipitable water from satellite images**

Simona Malmusi and Mauro Boccolari

University of Modena and Reggio Emilia, Department of Engineering of Materials and Environment, Modena, Italy  
(simona.malmusi@unimore.it)

Aim of this work is the investigation of middle-upper tropospheric (above 850 hPa) precipitable water space-time distribution obtained from satellite images, in order to look for typical patterns related to tropical and extra-tropical teleconnections.

Precipitable water data are calculated from daily tropospheric humidity product derived from two water vapour channels of meteorological geostationary satellites Meteosat-8/-9. Tropospheric humidity provides a layer-mean relative humidity for two tropospheric layers (between 600 and 850 hPa and between 850 and 600 hPa).

Monthly analysis of precipitable water has been realized for the period February 2004 - January 2009, over a circular area covered by satellites Meteosat-8/-9 (the satellite radiometer has a resolution of 3 km), included between 63 degree north and south of latitude and between 63 degree west and east of longitude. This area comprises all African continent and Middle East, Atlantic Ocean, the east part of Brazil and the major part of Europe.

The time-space analysis of monthly middle-upper tropospheric precipitable water fields has been obtained by using different explorative and statistical analysis methods (e.g. extended EOF). It has revealed a weak and a moderate El Niño phenomena (between JJA 2004 and JFM 2005 and between JAS 2006 and DJF 2007) and a moderate La Niña event (between ASO 2007 and AMJ 2008).