Geophysical Research Abstracts
Vol. 16, EGU2014-15176, 2014
EGU General Assembly 2014

Water vapour intercomparison effort in the frame of HyMeX-SOP1

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ABSTRACT
A water vapour intercomparison effort, involving airborne and ground-based water vapour lidar systems and mesoscale models, was carried out in the framework of the international HyMeX (Hydrological cycle in the Mediterranean Experiment) dedicated to the hydrological cycle and related high-impact events. Within HyMeX, a major field campaign was dedicated to heavy precipitation and flash flood events from 5 September to 6 November 2012. The 2 month field campaign took place over the Northwestern Mediterranean Sea and its surrounding coastal regions in France, Italy, and Spain. The main objective of this work is to provide accurate error estimates for the lidar systems i.e. the ground-based Raman lidar BASIL and the CNRS DIAL Leandre 2 on board the ATR42, as well as use BASIL data to validate mesoscale model results from the MESO NH and Arome WMED. The effort will benefit from the few dedicated ATR42 flights in the frame of the EUFAR Project "WaLiTemp". In the present work our attention was focused on two specific case studies: 13 September and 2 October in the altitude region 0.5 – 5.5 km. Comparisons between the ground-based Raman lidar BASIL and the airborne CNRS DIAL indicate a mean relative bias between the two sensors of 6.5%, while comparisons between BASIL and CNRS DIAL vs. the radiosondes indicate a bias of 2.6 and -3.5 %, respectively. The bias of BASIL vs. the ATR insitu sensor indicate a bias of -20.4 %. Specific attention will also be dedicated to the WALI/BASIL intercomparison effort which took place in Candillargues on 30 October 2012. Specific results from this intercomparison effort and from the intercomparison between BASIL and Meso-NH/AROME-WMed will be illustrated and discussed at the Conference.