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# High resolution Raman lidar measurements for the characterization of the water vapour inflow in the frame of the Hydrological Cycle in the Mediterranean Experiment

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The University of BASILicata Raman Lidar system (BASIL) was deployed in Candillargues (Southern France, Lat: 43°37' N, Long: 4° 4' E) in the frame of the Hydrological Cycle in the Mediterranean Experiment - HyMeX. Within this experiment a major field campaign (Special Observation Period 1-SOP1, September to November 2012) took place over the Northwestern Mediterranean Sea and its surrounding coastal regions in France, Italy and Spain, with a specific focus on the study of heavy precipitation and flash-flood events. During HyMeX-SOP1, BASIL operated between 5 September and 5 November 2012, collecting more than 600 hours of measurements, distributed over 51 measurement days and 19 intensive observation periods (IOPs).
The major feature of BASIL is represented by its capability to perform high-resolution and accurate measurements of atmospheric temperature and water vapour, both in daytime and night-time, based on the application of the rotational and vibrational Raman lidar techniques in the UV (Di Girolamo et al., 2004, 2006, 2009).
This makes it an ideal tool for the characterization of the water vapour inflow in Southern France, which is important piece of information to improve the comprehension and forecasting capabilities of heavy precipitations in the Northwestern Mediterranean basin.
Preliminary measurements from this field deployment will be illustrated and discussed at the Conference. These measurements allow to monitor and characterize the marine atmospheric flow that transport moist and conditionaly unstable air towards the coasts, which is feeding into the HPE events in Southern France. Measurements from BASIL can also be used to better characterize Planetary Boundary Layer moisture transport mechanisms from the surface to deep-convection systems.
Besides temperature and water vapour, BASIL also provides measurements of the particle (aerosol/cloud) backscattering coefficient at 355, 532 and 1064 nm, of the particle extinction coefficient at 355 and 532 nm and of particle depolarization at 355 and 532 nm. The simultaneous characterization of the three-dimensional fields of water vapour, temperature and aerosol/cloud have the potential to lead to a better comprehension of the life cycle of HPE events around the Mediterranean Basin and ultimately lead to an improvement of cloud microphysical parameterization in Numerical Weather Prediction (NWP) models.

References

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