

HYDRORAD PROJECT SUPPORTING MATERIAL

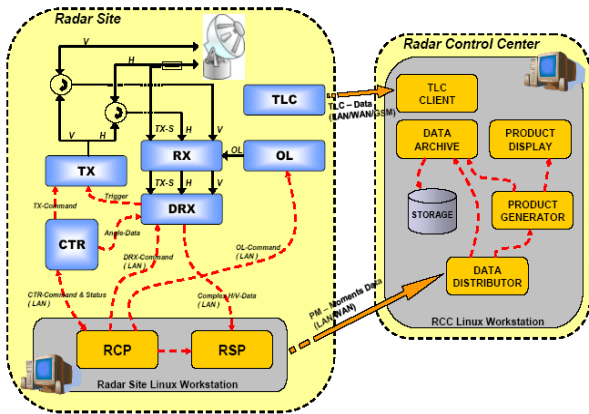
	<p>Timetable: from September 2009 to November 2011</p> <p>Total cost: € 1.437.000,00</p> <p>Instrument: FP7-BSG-SME Research for SMEs</p> <p>Grand Agreement n. 232156 FP7-SME 2008-1</p>
<p><i>HYDRORAD Logo</i></p>	<p><i>HYDRORAD relevant information</i></p>
	<p>CONTACT</p> <p>Professor Frank Marzano Project Coordinator HIMET s.r.l Strada Statale 17 Ovest, 36 67100 L'Aquila (Italy) T +39 0862 319378 E marzano@diet.uniroma1.it www.himet.it/hydrorad</p>
<p><i>Picture of the representative HYDRORAD people</i></p>	<p><i>HYDRORAD coordinator contact detail</i></p>
 <p>HIMET (L'Aquila, Italy) RST (Athens, Greece) PROPLAN (Nicosia, Cyprus) ELDES (Florence, Italy) NOA (Athens, Greece) SHMS (Chisinau, Moldova) MICC (Chisinau, Moldova)</p>	<p>WP1: X-band polarimetric mini-radar system design optimization, production and deployment</p> <p>WP2: X-band radar algorithm development and system interface.</p> <p>WP3: Hydrological modeling development, set up and implementation</p> <p>WP4: Meteorological modeling development, set up and implementation</p> <p>WP5: Test the overall system in the Moldova Operational Field campaign (MOF)</p> <p>WP6: Hydro-meteorological application, validation and end using</p> <p>WPO: Project management, dissemination and administration</p>
<p><i>List of all HYDRORAD beneficiaries and logos</i></p>	<p><i>HYDRORAD project is organized in seven Work Packages (WPs). The articulation of WPs closely follows the breakdown of the objectives</i></p>



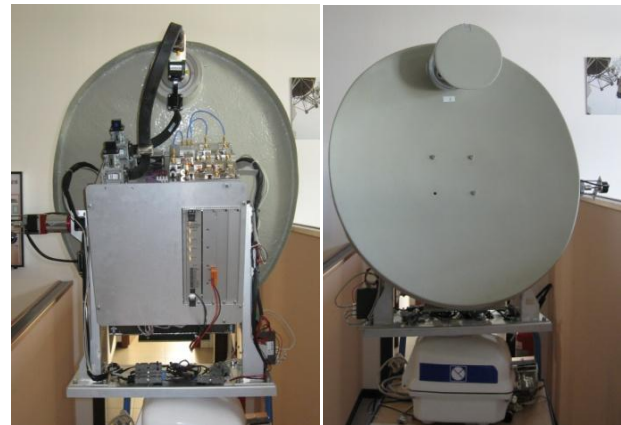
Fixed tower-based WR-25XP radar: transmitter, receiver and antenna parts are inside the radome



The mobile WR-25XP radar is securely fastened to a trailer that can be easily moved by a car or a small truck

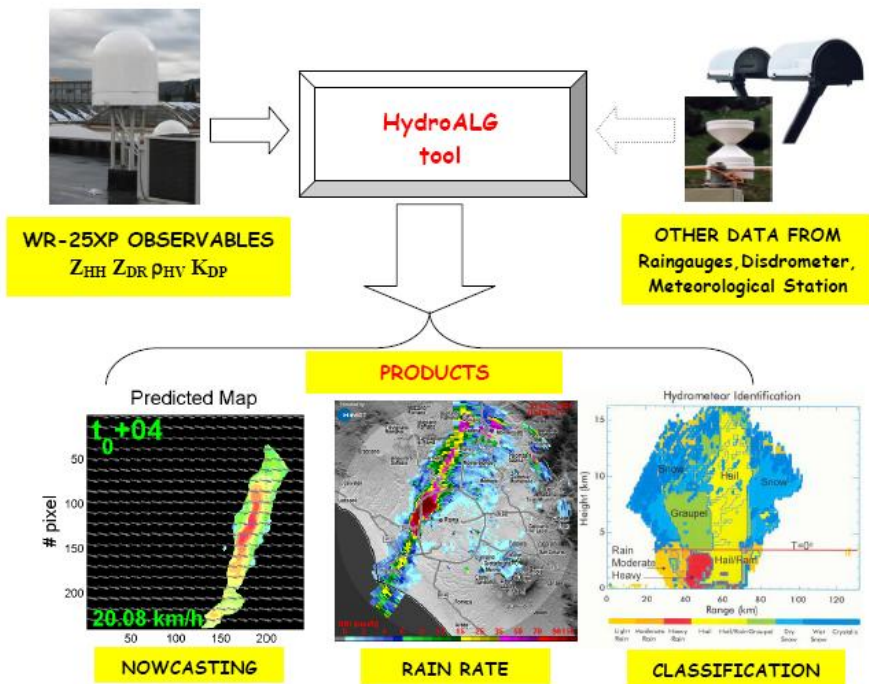


The scheme of main subsystem components

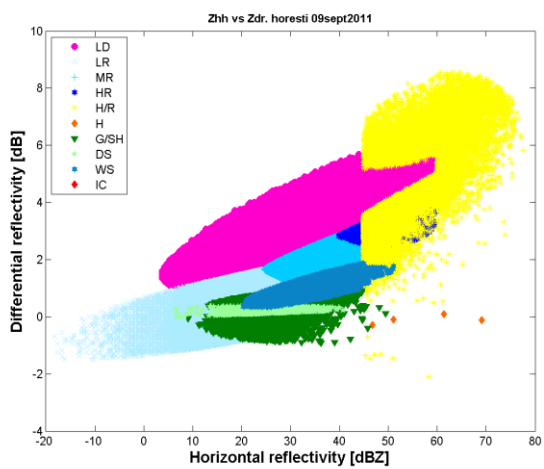


Pictures of main parts such as antenna offset-Cassegrain and trans-receiver that are placed inside the radome

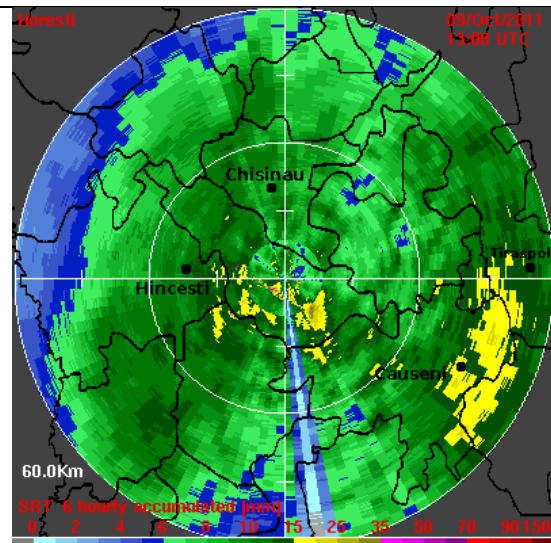
WP1: X-band polarimetric miniradar system design and production



The HYDROALG tool algorithms convert radar observables into hydro-meteorological useful products

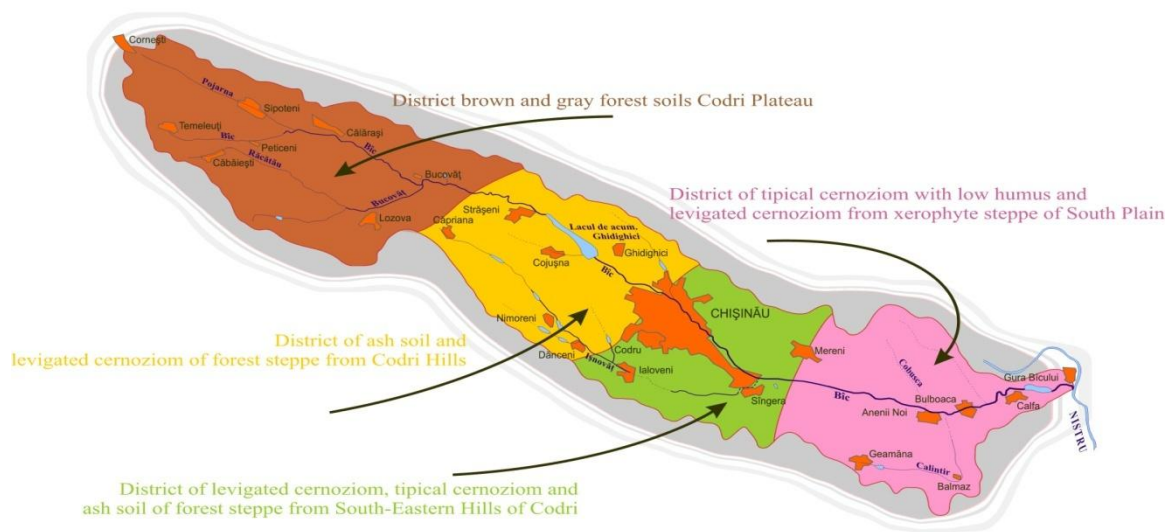


Scatterplot between Z_{hh} and Z_{dr} taken from WR-25XP volume acquisitions at Horesti site: ten hydrometeor classes are here identified in the classification

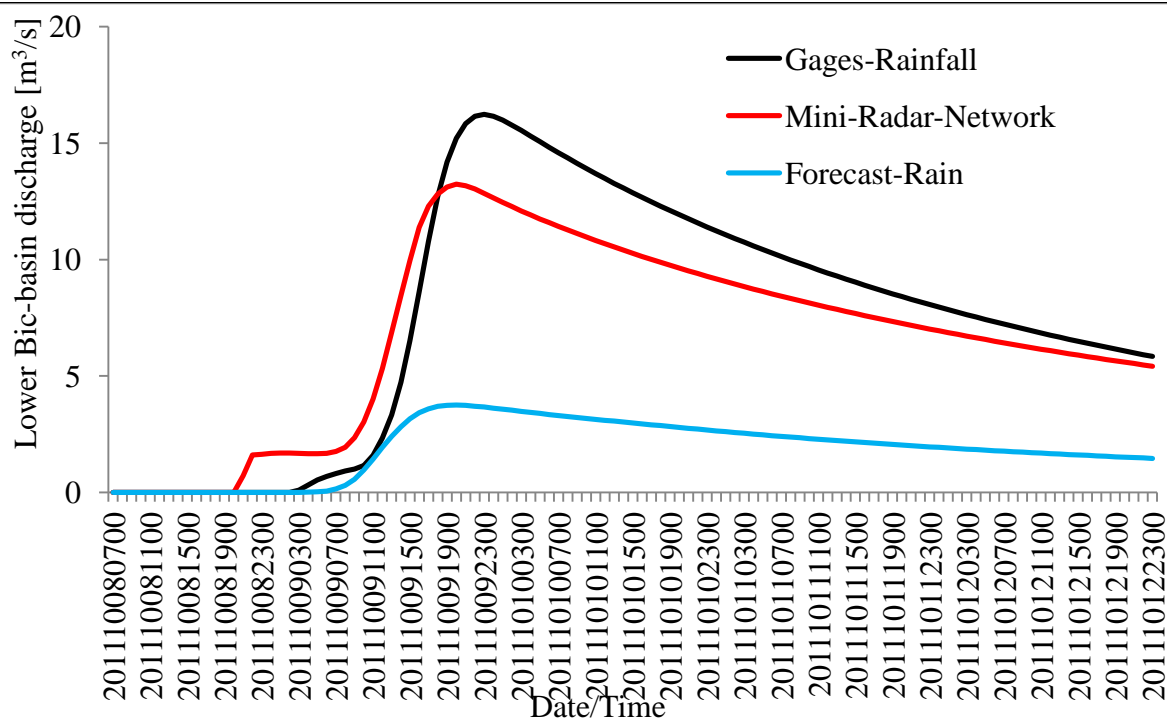


Six hours accumulated rainfall from WR-25XP located at Horesti site. The effect of beam blockage in south direction is quite evident

WP2: X-band radar algorithm development



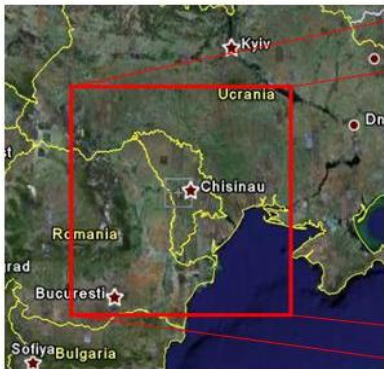
Moldova Bic River basin watershed soils map



Moldova River Bic basin streamflow simulations from the hydrologic model forced with the various rainfall sources

WP3: Hydrological model on Moldovan territory

Resolution: 27 km



9 km

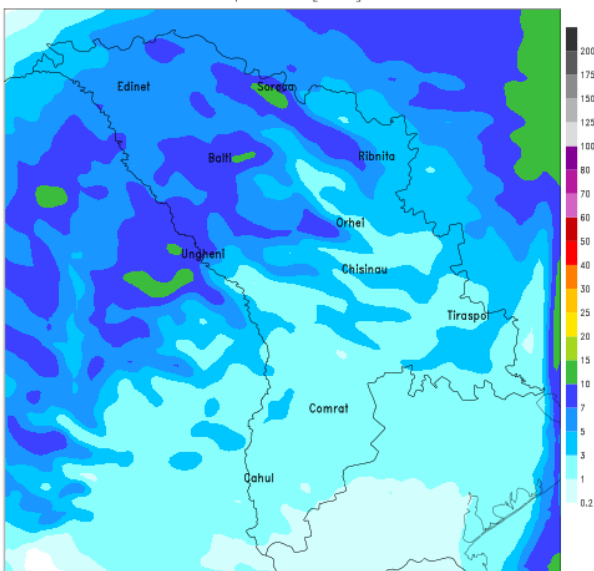


3 km



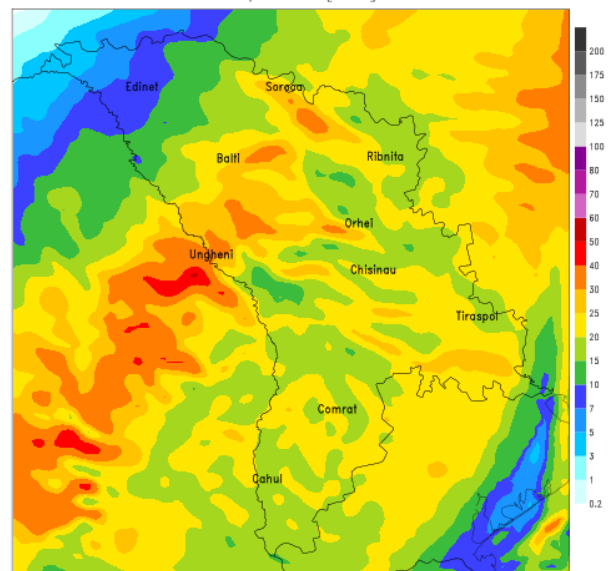
Two-way nested domains for the MM5 forecast model for Moldova territory model at 27, 9 and 3 km resolution

6 hr Accumulated Precipitation [mm] 14Z09OCT2011 Sun



MM5 forecast output: 6 hours accumulated rain on the whole Moldovan territory

24 hr Accumulated Precipitation [mm] 14Z09OCT2011 Sun

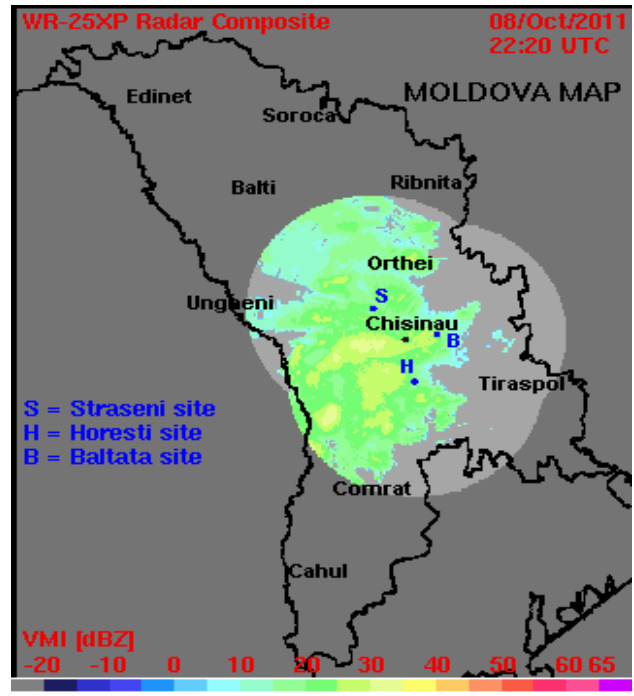


MM5 forecast output: 24 hours accumulated rain on the whole Moldovan territory

WP4: Meteorological model on Moldovan territory



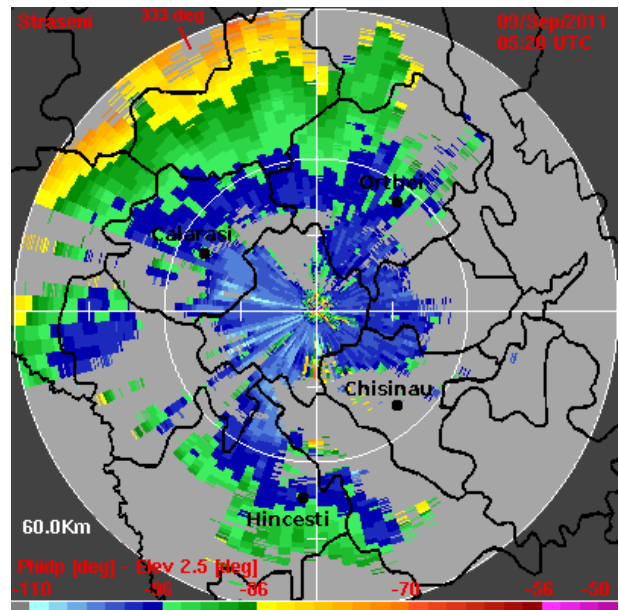
The locations of the available instrumentations for Moldova Operational Field (MOF) campaign. The coverage area of each radar system is also shown



A nice example of horizontal reflectivity Z_h - VMI radar composite product achieved from the three radars acquisition

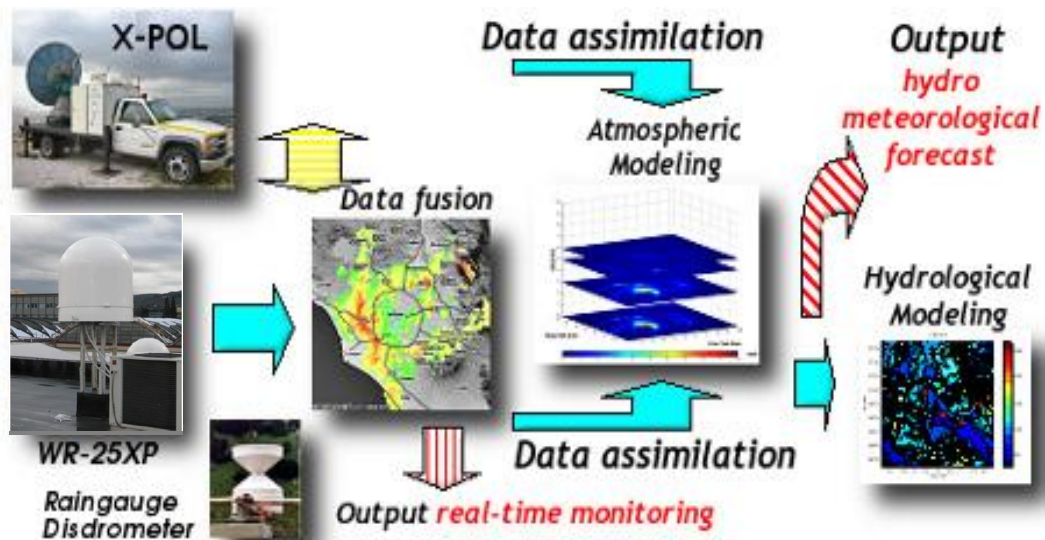


Mobile WR-25XP unit at Baltata site (top) and X-POL benchmark radar at Chisinau (bottom) during the installation phase

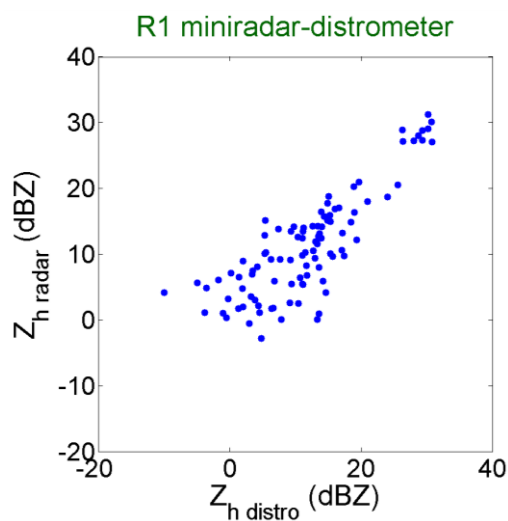


Example of differential propagation phase shift Φ_{dp} from the WR-25XP radar located at Straseni site

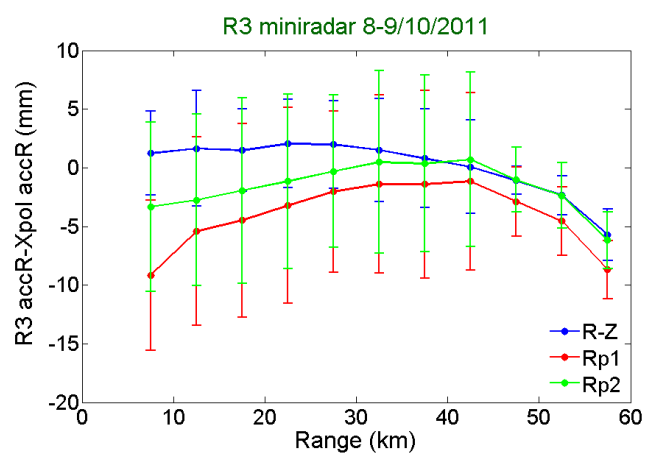
WP5: Overall system test in the Moldova Operational Field campaign (MOF)



The analysis and validation of the new polarimetric X-band mini-radar system data has been carried out utilizing reference data taken from available instrumentations. The WR-25XP data has been assimilated onto hydro-meteorological model as well



Comparison of WR-25XP mini-radars reflectivities Z_h with disdrometer data



Statistical difference between WR-25XP mini-radars and X-POL rain estimates versus range

WP6: Hydro-meteorological application and validation



The HYDRORAD project



PARTNERS

HIMET (L'Aquila, Italy)
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CONTACT

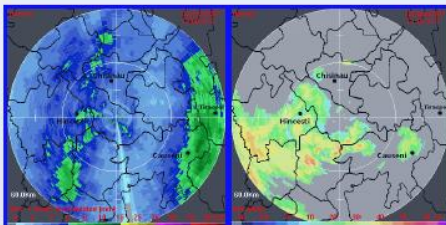
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<http://cordis.europa.eu/fp7>

RESULTS

The main result of the HYDRORAD project is the development of an innovative *decision support tool* for weather monitoring and hydro-meteorological applications. The integrated system tool is based on an optimized polarimetric low cost X-band mini-radar network, an useful radar products generator and a hydro-meteorological forecasting modeling able to ingest precipitation data and mini-radar products

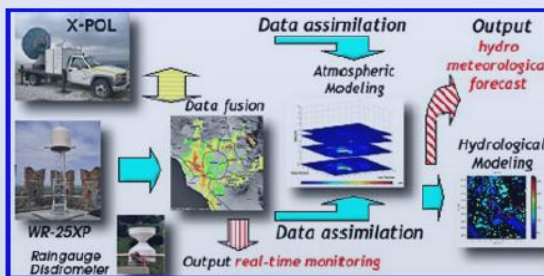


APPLICATION

Decision support tool developed seems to be the best low-cost solution to the problem of hydro-meteorological forecasting and monitoring for weather surveillance especially for civil prevention and protection purposes



INNOVATIVE RADAR SYSTEM Highly innovative X-band polarimetric mini-radar system (called WR-25XP) has been optimized and deployed. Due to the relatively good system sensitivity and high spatial resolution the WR-25XP guarantees high performances in order to support flood prevention within urban environment and small-scale basins



MOLDOVA FIELD TEST

During Moldovan Operational Field (MOF) campaign three upgraded WR-25XP radar systems and decision support tool have been successfully tested comparing against a state-of-the-art radar (X-POL) and against in situ weather station measurements (one video disdrometer, one Doppler flow meter and several rain gauges)



WP0: Example of promoting project purpose and results