

## **Radar Networking over the Tyrrhenian sea**

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In the framework of the Operational Maritime Program (Italy-France), the activities of some related projects have led to the definition and implementation of a “cross-border” weather radar network, currently undergoing expansion. This work presents the processes constituting the realisation of this shared system for observing weather phenomena over the Tyrrhenian area within the Tuscany, Liguria, Sardinia and Corse regions. Different radar systems are involved in this network, with different operating frequencies, some of them having doppler and polarimetric measurement characteristics. Currently, this radar network consists of the C-band Monte Rasu (Sardinia) radar, the S-band Aleria (Corse) radar and the two X-band Livorno and Elba (Tuscany) radars. Within some months a third X-band radar will be installed in Monte Marcello (Liguria) thanks to the activities of the ongoing Proterina-2 project which is based on an integrated multirisk approach, spacing from the hydrogeological to the fire-risk assessment.

This multi-systems architecture has needed and still needs some technical and scientific activities for the optimisation of its operation. Using different type of radars, with different operating frequencies, a training period is mandatory for the intercomparison and intercalibration of the different measurements. One of the advantage of such multi-system approach is undoubtedly the observation redundancy, giving guarantees also in case of failure of one or more observing system. The integration of the different radars has been realised by considering the observing geometries together with the terrain morphology (DTM), in order to analyse the visibility and occultation due to the orography. An unconventional georeferentiation method has been also adopted to retain the 3D information of the different observations. As most of the systems are directly observing open sea scenarios, the observations are affected by sea clutter. A suited sea clutter removing algorithm has been applied taking advantage of both horizontal and vertical distribution of voxels.