

Evaluation of hydrometeor classification algorithms from multi-frequency dual-polarimetric radar observations collected during HyMeX

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The present paper aims at evaluating the performance of a hydrometeor classification algorithm (HCA) that was specifically designed to process radar data collected during the special observing period of the Hydrometeorological Cycle in the Mediterranean Experiment (HyMeX). The proposed method consists in comparing HCA outputs inferred from the analysis of multi-frequency radar observations collected by pairs of neighboring radars. The rationale for this approach is that two dual-polarization radars should detect the same hydrometeor populations within their common sampling areas regardless of their wavelength and of their overall characteristics. Such evaluation is critical in order to produce three-dimensional composite fields of hydrometeors that would be used for process studies or for evaluating the performance of microphysical schemes used in numerical weather prediction systems.

After a description of the fuzzy logic algorithm and of the verification methodology, this paper will present an evaluation of HCA outputs through comparing results obtained within the common sampling area of Nîmes (S-band), Collobrières (S-band) and Montclar (C-band) radars for a variety of weather events observed during HyMeX. More conventional comparisons against in-situ measurements made with a Falcon 20 research aircraft will also be presented. Finally, an interpolation method allowing to merge hydrometeor data collected by different radars will be discussed and evaluated from data collected within a bow echo system observed during HyMeX IOP 6.