Comparison of MRR and weather radar measurements in Mediterranean precipitation

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During the special observation period of the HyMeX project (see http://www.hymex.org for more information) in autumn 2013, a micro-rain radar (MRR) was collocated to the polarimetric dual-polarization Doppler radar (called MXPol) managed by the Environmental Remote Sensing Laboratory (LTE) of the EPFL, Lausanne, Switzerland. In the MXPol scan (total duration of 5 min), we focus in particular on the two vertical profiles of Doppler spectra that were collected at a high resolution (75 m radial, 1.5 deg beamwidth and 0.06 ms^-1 for the velocity spectrum). In addition to the radar systems, an optical disdrometer (Parsivel, 1st generation) collected the raindrop size distribution (DSD) at the ground level. About 12 precipitation events have been sampled by the two sensors, corresponding to about 2000 profiles in rainfall. This data set makes possible the in-depth comparison, in the context of Mediterranean precipitation, of the vertical structure seen by the two radar systems, as well as of the retrieved vertical profile of DSDs. Attenuation can be significant at the MRR frequency (about 24 GHz), and its possible effect on the Doppler spectrum in rain is also investigated.