



A polarimetric approach for attenuation compensation in presence of rain/hail mixture

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Recent experiments have confirmed the advantage of using dual-polarized radars with respect to conventional single polarization systems for hail detection at S band. Due to lower costs and higher sensitivity, most of European radar networks use C-band systems which, as known, are affected by attenuation. Attenuation correction procedures proposed so far for single frequency radars have been designed for rain only. Nevertheless, it is well known that wet ice can produce large attenuation that can not be compensated using currently available methodologies. An iterative correction procedure based on preliminary classification of the observed hydrometeor types is applied to fill that gap. Fuzzy logic based algorithms are fairly consolidated approaches for the discrimination of hydrometeors because of the partial overlapping of radar signatures. A fully polarimetric version of the technique proposed by Marzano et al. is applied in the present work. The proposed correction methodology, applied to an intense hail-storm observed in the Paris area, has shown a remarkable improvement with respect to other techniques currently available in the literature.