

Interactive comment on “Fuzzy logic filtering of radar reflectivity to remove non-meteorological echoes using dual polarization radar moments” by D. R. L. Dufton and C. G. Collier

Anonymous Referee #3

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GENERAL COMMENTS

The paper presents a fuzzy logic scheme based on dual-polarization moments, the determination of the membership functions and an evaluation of the performance. Dual-pol based fuzzy logic schemes are not new and the benefit for removing meteorological signals in radar observations has been already shown. Nevertheless, it is always useful to refine these schemes and to evaluate them on new datasets. The paper is well written and the methods and results are generally clearly presented.

I see some weak points in the study. Some of them have been already mentioned by

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the other referees.

- I don't see substantial novelty in the proposed fuzzy logic scheme. The use of radial texture parameters is already proposed in some commercial radar software packages. The only new thing at my knowledge is perhaps the use of a range dependent correction applied to the texture parameters.

- The training data set (one or two hours of data depending on echo type) is very small and is not representative at all of the large variety of possible weather situations and sources of non-meteorological signals. The latter is particularly true for biological scatterers.

- The evaluation is very limited and very subjective. Only three specific cases and the accumulation over the 3-month COPE observation period are considered. No attempt has been made to quantify the performance of the scheme. Accumulation over long durations is certainly one of the things to do for checking the quality of non-met echo removal but it seems that only one rain-gauge is used is the evaluation.

SPECIFIC COMMENTS

- Fuzzy logic schemes are generally used complementary to other clutter removal methods like Doppler filtering or static clutter maps. Did you consider using some additional complementary methods ? - Disturbances from Radio Local Area Networks are not mentioned in the review of possible non-met signals and not addressed in the paper. They are however a growing source of perturbations, at least in Europe. Is your scheme appropriate for removing such disturbances ? - The paragraph 1.1.3 on the use of differential phase shift does not make appear very clearly what can be inferred for this parameter. - The range dependent correction described in 3.1.1 should be better justified and described. The impact of beam broadening on the radial texture field is not so straightforward. - The impact of the filter on the 3-month accumulation should be better analysed and quantified, for example by comparison with several rain gauges.

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