

## **Ensemble of radar and MM5 precipitation forecast models with M5 model trees**

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**Abstract** The use of weather radars for precipitation forecasting in fast response river basins is very important for early warning systems. Some of the most used techniques, such as radar echo tracking, which is based on patterns and correlations, do not contemplate the decay/growth mechanism of rainfall systems. Numerical weather prediction models do consider much more information than radars, but their accuracy is less than the radar forecast; at least for a lead time of up to several hours. In this paper we explore the integration of the two forecasting approaches. The MM5 numerical weather prediction model is set up for a region in southeast England. The Nimrod radar data, for the same region, from the British Atmospheric Database Centre (BADC) is adapted and used as reference. The M5 prime regression model tree is used for the integration of both models. The results show that the proposed integration reduced the error of tracking significantly. The results presented here have been evaluated on an hourly time step, but further research will be done in order to extend and generalize the methodology.

**Key words** weather radar echo tracking; MM5 model; model trees; model integration; numerical weather prediction; nowcasting