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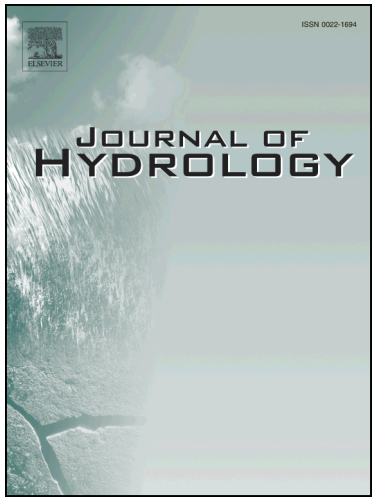

Combination of radar and daily precipitation data to estimate meaningful sub-daily point precipitation extremes

András Bárdossy, Geoffrey Pegram

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Combination of radar and daily precipitation data to estimate meaningful sub-daily point precipitation extremes

András Bárdossy[a,b], Geoffrey Pegram[b]

[a] *Institute of Hydraulic Engineering, University of Stuttgart, Stuttgart D-70569, Germany, Phone: +49 711 685 64663, email: bardossy@iws.uni-stuttgart.de*
[b] *Civil Engineering, University of KwaZulu-Natal, Durban, South Africa.*

Abstract

The use of radar measurements for the space time estimation of precipitation has for many decades been a central topic in hydro-meteorology. In this paper we are interested specifically in daily and sub-daily extreme values of precipitation at gauged or ungauged locations which are important for design. The purpose of the paper is to develop a methodology to combine daily precipitation observations and radar measurements to estimate sub-daily extremes at point locations. Radar data corrected using precipitation-reflectivity relationships lead to biased estimations of extremes. Different possibilities of correcting systematic errors using the daily observations are investigated. Observed gauged daily amounts are interpolated to unsampled points and subsequently disaggregated using the sub-daily values obtained by the radar. Different corrections based on the spatial variability and the subdaily entropy of scaled rainfall distributions are used to provide unbiased corrections of short duration extremes. Additionally a statistical procedure not based on a matching day by day correction is tested. In this last procedure as we are only interested in rare extremes, low to medium values of

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