

## ***Interactive comment on “A robust and parsimonious regional disaggregation method for deriving hourly rainfall intensities for the UK” by D. Maréchal and I. P. Holman***

### **C. Onof (Referee)**

c.onof@imperial.ac.uk

Received and published: 20 July 2005

This is my second attempt at commenting on this paper since the first one failed at the final hurdle as a result of a bug in the on-line software, or more likely, my having bungled it... I shall therefore be brief. This is a useful paper on an important subject. The method proposed does not provide a regionalisation of the type of method reviewed in the introduction (i.e. a stochastic model approach) since it does not provide a temporally structured hourly output. This should be made clearer as the introduction could be understood as suggesting otherwise. Also, the papers discussed in the review are a somewhat heterogeneous mixture of hourly generators and disaggregators (one a multivariate one) which is not entirely up-to-date (Koutsoyiannis and Onof have proposed a daily to hourly disaggregator using a pulse-based model - see J. Hydrology,

Full Screen / Esc

Print Version

Interactive Discussion

Discussion Paper

2001). Finally, the statement that stochastic models are 'inappropriate for regional or national studies' is not given any justification, and I would certainly take issue with it. As demonstrated earlier by Cowpertwait (1996), it is indeed possible to regionalise such models. The issue is generally one of getting hold of sufficient amounts of hourly data from the Met Office without breaking the bank (and of finding sponsors for this kind of work).

The model proposed by the authors shows that the fits obtained for the reproduction of the 5 largest hourly rainfalls are good (figure 5), but I have one important concern. The authors use a log-Normal distribution to represent the largest hourly rainfall (conditional on daily rainfall  $> 15$  mm). The fit shown in figure 2 is very good but shows discrepancies for hourly rainfalls  $> 50\%$  of the daily total. This suggests the log-Normal distribution underestimates large hourly rainfalls. This concern is further fuelled by the results of the statistical tests. 81% of the K-S tests show no significant difference model/observations at the 95% confidence level. This points to some significant discrepancies and I suspect they are in the tail of the distribution. Additionally, figure 6(c) shows a big spread for the larger intensities, which also points to weaknesses in the reproduction of the tail. The issue of how best to represent the distribution of extreme rainfalls is of course an old and much discussed topic. Recent work by Chaouche et al. (2002 in SERRA) and Koutsoyiannis (2004 in J. Hydrology - for daily rainfall) indicates however that fat-tailed distributions are to be preferred for this purpose. I would like the authors to comment on these concerns about the possible shortcomings of the log-Normal distribution. Having said that, failures of models to satisfactorily reproduce the largest extremes are hardly grounds for dismissing a model. Given the appealing simplicity of the model, its usefulness, and the good fits that are obtained, I think there is much to commend this tool.

---

Interactive comment on Hydrology and Earth System Sciences Discussions, 2, 1047, 2005.

[Full Screen / Esc](#)[Print Version](#)[Interactive Discussion](#)[Discussion Paper](#)