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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Comparison of methods for separating flood frequency of reservoir by sub-seasons" *by* J. Li et al.

G. Pegram (Referee)

pegram@ukzn.ac.za

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Review of hess-2015-378 Li et al

In this paper, three methods are used to determine the frequency of flows in the flood-prone period (i) during six month of a year, (ii) divided into ten day sub-periods, (iii) above a chosen set of thresholds into a reservoir. The three methods consist of: (i) a curve fitting method using the von Mises (circular normal) distribution, (ii) a conventional ranking method and (iii) a more complicated fractal method to find the self-similarity of the three largest floods in each sub-period. No time series analysis is performed and there is limited discussion of reservoir levels in conjunction with inflows; the reservoir draw-dawn levels are offered in Figure 5, but the way these are obtained

is obscure. The ranking of the frequency of the top three floods in each 10-day period is chosen independently of those in contiguous time intervals, which destroys useful temporal information in the hydrograph. Also, it is not clear, from the time series of the top three highest flows in Figure 2, that ranking has been maintained - in the intervals 6-2 to 6-22 and on 7-12, it appears that the maximum flow in a 10-day period is lower than the 3rd largest flow, which is nonsense.

In my opinion, this paper is not about hydrology, but mathematicity. However, in mitigation, a re-read of the paper finds on page 10432, lines 22-26, that the methods of flood regulation are limited in China: "Regulation for calculating design flood of water resources and hydropower projects of China requires that flood season separation should consider the design requirements of projects, and have appropriate flood timing according to seasonal varying flood patterns. This means design floods of different sub-seasons should be calculated based on flood characteristics for project design for practical construction and operation."

In the conclusion, it seems that the model of choice is the von Mises approach. However, it is worrying that in Figure 4, the 'mixed von Mises' distribution which is a composite of three distributions, misses the observations' frequencies by 10 days [late] for the two highest probabilities of flood prone time intervals, which is not useful. The tables are uninformative; for example in Table 1, we have a wording problem. The "Number of times" in a chosen 10-day period should be labelled "Distribution of frequency", "Frequency" should be labelled "Cumulative Frequency (%)"; it is irritating to have to unpack these labels to understand the rather unconventional presentation while reading.

In my opinion this paper lacks originality, does not address the scheduling problem, is rather parochial in its referencing, is not of sufficient interest nor of high enough standard for publication in HESS and should be rejected.

Geoff Pegram 05 November 2015