

***Interactive comment on* “Exploring the physical controls of regional patterns of flow duration curves – Part 1: Insights from statistical analyses” by L. Cheng et al.**

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Overall, this is a good paper, and a useful addition to the literature on PUB. My main comment is that the authors demonstrate that the baseflow index is of key importance in identifying the characteristics of the FDC (although this is not a particularly surprising result). The authors should note of course that streamflow is required (at least for some period of time) in order to calculate the baseflow index, so the results are of limited in use in regionalising to truly ungauged catchments.

Secondly, I do not think that the log-log curves chosen to present these data are the

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best choice. It is making the differences in the tail of the distribution look very large indeed, whereas the numbers involved are quite small. In contrast, the author claims that the fits are ‘slightly underestimated’ for high flows in most catchments. While this looks to be true on the graph, it is only the log-log plot that makes it look this way. I suspect that some of the high flows are being fit very poorly indeed.

This statement is returned to in the conclusion, stating that ‘the lower tail of the FDCs... seem especially difficult to capture’. I’m not sure that the authors have demonstrated that the tails are more difficult to capture than the peaks (at least not using Figure 3), although I suspect that this is in fact true.

Finally, it is not acceptable to simply refer a paper by Walsh and Lawler in 1981 to define the seasonality index. This is not a particularly common index and it needs defining here. For example, I do not understand how the seasonality index can be greater than unity as it appears to be in Fig 1 (c).

Minor comments: I assume Zhao et al. 2011 should be Zhao et al. 2012. P7007, line 18. ‘the outlines of’ should be ‘outlines the’. P7011, line 5, ‘approaching’ should be ‘approach’. P7017, line 26 ‘54 catchments’ should be ‘54 years’

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