

## ***Interactive comment on “Bayesian discharge rating curves based on B-spline smoothing functions” by K. M. Ingimarsson et al.***

### **Anonymous Referee #2**

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#### General issues

The paper presents an extension of the standard power-law model for estimating the discharge rating curve based on the Bayesian approach and B-splines functions. The power-law model is implemented to model the main trend in discharge as a function of water level, the remaining variability is modelled by B-splines functions which allow for more flexibility. A Bayesian approach is used for the model parameters estimations. A comparison between the standard model and the proposed one is performed on several rivers where water surface and discharge measures were available. The paper is difficult to follow because it merges methodological and technical issues without distinguishing them for relevance or importance. It does not reach general scientific

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conclusions, but presents only the results of an experiment. The literature review is very poor for such an important question. However, in my opinion, the main point is that the paper ignores any physically meaningful aspect of the problem of the rating curve estimation, reducing it to a trivial curve fitting. Although it is recognized the effort of the authors in the implementation of an efficient procedure for discharge rating curve fitting, I do not recommend the publication of this paper on HESS because it misses conclusions scientifically relevant.

### Specific issues

The Figures 1,2,3 and 5 should be re-arranged to have the results of the two models side-by-side in order to make them more easy to reread. 2750-19, I would use river section instead of river bed Par.2, It should be provided also a description of the rivers (dimensions, slope, etc..). The data used should be also synthetically described. 2761-20, Figure 1, instead of Figure A. Par.6, Could it be any physical reason for the choice of wupp? 2778-Fig.3. Delete "shows" from the caption.

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