Hydrol. Earth Syst. Sci. Discuss.,
doi:10.5194/hess-2015-514-RC2, 2016

Hydrology and Earth System Sciences
Discussions
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Interactive comment on "Error reduction and representation in stages (ERRIS) in hydrological modelling for ensemble streamflow forecasting" *by* Ming Li et al.

Anonymous Referee #2

Received and published: 8 May 2016

It is a very well written paper, with an excellent overview. Figures illustrate the text well. The paper is mathematically rigorous. A considerable number of case studies are used for validation. Conclusions are well justified. Can be recommended for publication after some revisions; please see below.

The components of the approach are not new (distribution transforms and linear bias corrections and AR) but their combination seems to be useful, and their sequence is quite well justified. With respect to earlier literature, there are a couple of references which would be good to include, and to discuss the similarity and differences of these approaches.

1) Kelly and Krzysztofowicz, 1997; Montanari and Brath 2004 – meta-Gaussian ap-

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proach.

2) Solomatine and Shrestha (2009) presented a method of predicting residual error distribution. They make no assumptions about the error distributions (which is perhaps a weakness) but simply build a non-linear regression model (neural network) model able to predict quantiles of this distribution at each time step. This model is not autoregressive but uses more information about the state of the system.

3) In their DUMBRAE method Pianosi and Raso (2012) use an approach similar to what is presented in the reviewed paper – a residual error corrector and AR model. It would be very useful to compare the presented approach to DUMBRAE.

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I would make it clearer when you talk about a single model, and when about an ensemble. It is not immediately clear what the "error model" is – is a model providing the residual error, or the residual error distribution?

On page 9 it is mentioned that the flow forecast is the median of the ensemble flow forecast. This effectively makes model Qwave a deterministic model. It would be useful to clarify: is the presented method to be used only with the models using ensemble rainfall forecasts, or it can be applied to any (deterministic) model with a single (non-ensemble) input?

I suggest to provide a reference to Table 1 somewhat earlier – I think this would make reading easier.

–References–

Kelly, K. S., and R. Krzysztofowicz (1997), A bivariate meta-Gaussian density for use in hydrology, Stochastic Hydrol. Hydraul., 11(1), 17– 31, doi:10.1007/BF02428423.

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