

# ***Interactive comment on “Technical note: Inherent benchmark or not? Comparing Nash-Sutcliffe and Kling-Gupta efficiency scores” by Wouter J. M. Knoben et al.***

## **Anonymous Referee #2**

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### Summary:

The technical note provides interesting discussions on an interpretation of two metrics widely used in hydrologic community: NSE and KGE. First, the author reminds the readers that NSE is the metrics that quantify the performance compare to observed mean flow benchmark (NSE=0 indicates model performance is equivalent to this benchmark). The authors then state that there are many past studies that used KGE=0 as a threshold between bad and good model performance, same as NSE threshold. The authors point out KGE=0 does not hold the same meaning as NSE=0, and analytically show that  $KGE > -0.41$  indicates that the model performs better than

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observed mean flow (if a modeler compares the model to mean flow using KGE). The authors made a direct comparison between NSE and KGE by random sampling of each KGE component and corresponding NSE, showing there is no unique relationship between two metrics, but their range of NSE value given a KGE partly depends on Coefficient of variation of the observed flow, indicating NSE and KGE cannot be directly compared. Finally, the authors that single, aggregated metrics like NSE and KGE might be misleading if the modeler looks for a specific model application (i.e., flood forecast need accuracy of high flow), and the modelers need to look more targeted metrics related to the application.

#### Comment:

I agree on all the major statements made in this technical note. I think one Figure presented in the note is unique contribution. It is similar to Fig 6d Gupta et al.,2009, but is expanded version and generated in the different context. I think this is very informative article, and great particularly for hydrologic practitioners who tend to quickly and intuitively evaluate the model with either NSE or KGE. I did not find any corrections/suggestions I can offer and therefor I recommend publish as is.

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