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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Technical note: Pitfalls in using log-transformed flows within the KGE criterion" *by* Léonard Santos et al.

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1) From the reader's point of view, considering the current discussion, the current version of the manuscript needs to be reviewed by qualified referees who are specialized in the subject that is presented in the manuscript. Since this is a technical note, the need for more technical evaluation by the referees is required. Moreover, the referees' role should not be harbored to state whether or not the referees "like/hate/love" the manuscript.

2) As per the authors [see P-2 LN-2], Gupta et al. (2009) clearly demonstrated that discharge variability is not correctly taken into account for the evaluation. Therefore, Gupta et al. (2009) proposed a new criterion, Kling-Gupta efficiency (KGE), which provides

direct assessment of four aspects of discharge time series, namely shape and timing, water balance and variability[see P-2 LN-6]. As far as I remember, in 2006, this piece of idea was introduced by a graduate student. Therefore, respecting Mr. Donald Trump's intention of preventing people from stealing someone's ideas/works/technologies, it would be more appropriate for the authors to evaluate the originality of Gupta et al. (2009)'s work.

3) As per the authors, The KGE' criterion (Kling et al., 2012, denoted EKG in Eq. 1) is written as a sum of the distances to 1 (perfect value) of three components of the modelling error [see P-2 LN-20]. What is meant by "sum" of the "distances" to 1? What is the mathematical formula that is used to compute the distance? If we consider a three dimensional space (i.e., x-axis=ratio-1, y-axis=ratio-2, z-axis=ratio-3), isn't the square root component merely the distance from the origin (i.e., [1, 1, 1])?

4) What is the physical meaning of equation (1)? Let's say that the right-hand side of the equation (1) has two components. The first component is "1". The second component is the square root component that includes the ratios (e.g., beta). Why would you subtract the second component (i.e., square root component) from the first component (i.e., 1)? What is the physical meaning of the second component? What is the physical meaning of the first component? If the second component of the equation (1) represents the distance (see the definition), as per dimensional theories, the first component needs to be a distance. Otherwise, the operator (i.e., negative sign) becomes meaningless. What is the distance represented by the first component? What is the origin for the distance that is represented by the first component?

5) Does your equation (3) evaluate the water balance error? What is meant by water balance? What is the range of your beta value? Assume that we have the following monthly observed flow values :5,5,4,5,5,5,5,5,6,5,5,5. Assume that we have the following monthly simulated flow values: :5,5,6,5,5,5,5,5,5,5,5,4.As per your equation(3), if we consider all the flow values, the beta value is 1.However, if we consider the first six months, the value of the beta is not equal to 1. Is your beta value time dependent?

6) Assume that the ratio-1=1(i.e., equation (2)), ratio-2=1(i.e., equation (3)), and ratio-3=0.5(i.e., equation (4)). As per your equation (1), the value of KGE is 0.5. Now, assume that the ratio-1=1(i.e., equation (2)), ratio-2=0.5(i.e., equation (3)), and ratio-3=1(i.e., equation (4)). As per your equation (1), the value of KGE is 0.5. What is the physical meaning of the KGE values?

7) As per your equation (4), the ratio-3 is a function of your beta value. In other words, your ration-3 is a function of ratio-2(i.e., equation (3)). This gives an indication that the ratio-3 that is accounted in your equation (1) repeats the influence of ratio-2 in equation (1).

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