

## ***Interactive comment on “A geostatistical data-assimilation technique for enhancing macro-scale rainfall-runoff simulations” by Alessio Pugliese et al.***

### **Anonymous Referee #2**

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1. General Comments: This paper “A geostatistical data-assimilation technique for enhancing macro-scale rainfall-runoff simulations” develops a geostatistical method for enhancing streamflow simulation performance of large-scale rainfall-runoff models. The proposed method has proved to be effective for Tyrol area and shows great potential for basins with few gauges or even ungauged basins.

2. Some major comments: (1) Organizations of Section 5 seem to be not logical. Following “Section 4: study area”, some new method (e.g. LOOCV) and new metric (e.g. LNSE) are introduced in Section 5, and then followed by the findings and discussions. This may confuse readers as they may fail to grasp the intention and the core of this

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paper. It had better reorganize the manuscript in 'Method-Results' order. (2) The concept of total negative deviation (TND) is very essential to this paper's research. So, it is recommended that TND be explained more clearly with both words and figure. Particularly, Figure 1 should be interpreted in detail, for instance, what does the symbol '1' exactly stand for? (3) Why choose the mean annual flow (MAF) as the reference value  $Q^*$  in applying equation (3)? Does this mean that you didn't consider the flow above MAF when applying "TNDTK", according to the definition of TND by the shaded area in Figure 1? If this is the case, more should be elaborated on this. (4) Page 8 line 28. It stated that "each pair includes one of the E-HYPE catchments depicted in Fig. 4 and its corresponding gauged catchment." How to determine the corresponding gauged catchment for a certain E-HYPE catchment? By Equation 4 or other method? Please explain in detail.

3. Minor Comments: (1) I notice that Equation 1 takes the symbol 'i' as indicator of catchments, while in Equation 4 it represents the quantiles of  $q_i$ . This should be avoided. Please use a different symbol. (2) In Figure 9, the black dashed line indicates the observed streamflow series, which is not in line with its legend, where the black solid line is plotted. This is a minor mistake that could have been avoided. (3) In Figure 10, the meaning of the black triangles is interpreted in the title. This is not a good idea. Please use legends instead. (4) What does 'TNDTK' mean in the title of Section 2.1? DO NOT use abbreviation before it is defined.

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