

Interactive comment on “Technical note: Method of Morris effectively reduces the computational demands of global sensitivity analysis for distributed watershed models” by J. D. Herman et al.

Anonymous Referee #1

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Interesting work!. Good introduction, good methodology, sound conclusions with new insights about the potential of Morris method to estimate parameters in large models with many inputs. Anyway, one major comment to improve the quality of the paper, is the sampling method used to apply the Morris method (as it is not commented in the paper). In Campolongo et al., 2007, the issue of the necessity to improve the sampling matrix generation is highlighted. Such a method has gone under major revision in later works: Ruano et al. 2012. An improved sampling strategy based on trajectory design for application of the Morris method to systems with many input factors. Environmental

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Modelling & Software, 37, pp. 103 – 109; Campolongo et al. (Campolongo, Saltelli, and Cariboni. From screening to quantitative sensitivity analysis. A unified approach. Computer Physics Communications, 182 (4); 978-988, 2011) and the authors should at least be aware of these improvements. Another comment is that I do not agree that no differences in sensitivity information are obtained when increasing the Morris sample size. I agree that the resulting most sensitive and the non-sensitive there is no difference, but Figure 5 shows that as the sample size is increased the relationship between Morris and Sobol for the influential parameters becomes more lineal (of course there is non-linearity, but at least improves....). Morris screening no distinguish between non-linearity or/and interaction between parameters, when are influential, but at least when the Morris graph method is used, also information about this can be obtained. So, one option is to include the Morris graph in order to see this information regarding the influential parameters (high/low variance) and compared to Sobol results.

Minor comments: -typing error page 4283, line 11: "simulation" - Figure 3 caption, is too long, relevant results are commented in the caption. - At least, the most sensitive parameters must be further explained their role in the model in order to better interpret the results. - Page 4286, line 7, parameter UZK corresponds more to the headwaters than outlet. - Include how do you scaled the EE. - why in Figure 5, Morris sensitive measurement is not higher than 0.1? Figure 4 shows values up to 1.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 4275, 2013.

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