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Hydrology and Earth System Sciences
Discussions

Interactive comment on "The application of new distribution in determining extreme hydrologic events such as floods" *by* Łukasz Gruss et al.

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Dear Konstantinos Vantas, thank you for the comment. Various authors use the Chi-square (χ2) tests (Haktanir, 1991, Mamman et al. 2017, Szulczewski and Jakubowski, 2018) and the Kolmogorov-Smirnov test (K-S) (Haktanir, 1991) in similar studies. Each of these tests has been extensively used to indicate the adequacy of the distribution functions being tested. Moreover, authors such as Beskow et al. (2015) and Cassalho et al. (2018) indicated the Relative Absolute Error (RAE) test, while others like Szulczewski and Jakubowski (2018) indicated the Mean absolute relative error (MARE) test as a goodness-of-fit tests. We studied the rarely used three-parameter distributions and the new GGEV distribution proposed by Nascimento et al. (2016). We wanted to show the results obtained with the χ2 test and with the K-S test separately. This is very

important because it allowed us to compare our results with those of other scientists, which we included in the discussion. Of course, we could apply Bonferroni correction, but we do not think it is really necessary. Our results obtained by the MARE test are similar to the results of Szulczewski and Jakubowski (2018) for the best-fitted test. Like others, we also used the MARE test as the most decisive to indicate the best-fitted distributions. The MARE index is a measure of the model error fit and it is most suitable for engineering practice because it provides a quantitative estimate of high flows (Szulczewski and Jakubowski, 2018). We are currently preparing a manuscript on the modeling of floods on selected European rivers, in which we will apply the Bonferroni correction You propose.

Kind regards, Łukasz Gruss (on behalf of all coauthors)

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