

Home

Online Library HESS

- Recent Final Revised Papers
- [Volumes and Issues](#)
- Special Issues
- Library Search
- Title and Author Search

Online Library HESSD

Alerts & RSS Feeds

General Information

Submission

Review

Production

Subscription

Comment on a Paper

#### Journal Metrics



IF 2.462



5-year IF 2.670

SCOPUS<sup>®</sup> SNIP 0.856

SCOPUS<sup>®</sup> SJR 0.099

Definitions

ARCHIVED IN



PORTICO

[Volumes and Issues](#) [Contents of Issue 10](#) [Spec](#)

Hydrol. Earth Syst. Sci., 14, 1909-1917, 2010  
www.hydrol-earth-syst-sci.net/14/1909/2010/  
doi: 10.5194/hess-14-1909-2010

© Author(s) 2010. This work is distributed  
under the Creative Commons Attribution 3.0 License.

## Exploiting the information content of hydrological "outliers" for goodness-of-fit testing

F. Laio, P. Allamano, and P. Claps  
DITIC, Politecnico di Torino, Corso Duca degli Abruzzi 24, 10129 Torino,

**Abstract.** Validation of probabilistic models based on goodness-of-fit is an essential step for the frequency analysis of extreme events. The outcome of standard testing techniques, however, is mainly determined by the behavior of the hypothetical model,  $F_X(x)$ , in the central part of the distribution, while the behavior in the tails of the distribution, which is indeed very relevant in hydrological applications, is relatively unimportant for the results of the tests. The maximum-value test, originally proposed as a technique for outlier detection, is a suitable, but seldom applied, technique that addresses this problem. The test is specifically targeted to verify if the maximum (or minimum) values in the sample are consistent with the hypothesis that the distribution  $F_X(x)$  is the real parent distribution. The application of this test is hindered by the fact that critical values for the test should be numerically obtained when the parameters of  $F_X(x)$  are estimated on the same sample used for verification, which is the standard situation in hydrological applications. We propose here a simple, analytically explicit, technique to suitably address this effect, based on the application of censored L-moments estimates of the parameters. We demonstrate, with an application that uses artificially generated samples, the superiority of this modified maximum value test with respect to the standard version of the test. We also show that the test has comparable or larger power with respect to other goodness-of-fit tests (e.g., chi-squared test, Anderson-Darling test, and Paul test), in particular when dealing with small samples (sample size lower than 20–25) and when the parent distribution is similar to the distribution being tested.

[Final Revised Paper](#) (PDF, 388 KB) [Discussion Paper](#) (HESSD)

Citation: Laio, F., Allamano, P., and Claps, P.: Exploiting the information content of hydrological "outliers" for goodness-of-fit testing, *Hydrology and Earth System Sciences*, 14, 1909-1917, doi:10.5194/hess-14-1909-2010, 2010. [Bibtex](#) [EndNote](#) [Reference Manager](#) [XML](#)