Hydrol. Earth Syst. Sci. Discuss., 8, C1242–C1245, 2011
www.hydrol-earth-syst-sci-discuss.net/8/C1242/2011/

Hydrology and Earth System Sciences Discussions

Interactive comment on "Identification of hydrological model parameters for flood forecasting using data depth measures" *by* T. Krauße and J. Cullmann

Anonymous Referee #1

Received and published: 29 April 2011

The paper presents some improvement on the Robust Parameter Estimation (ROPE) algorithm (Bardossy and Singh, 2008) for the estimation of hydrological model parameters. Authors have tried to modify the stopping criterion of ROPE algorithm and make a new algorithm called AROPE. A comparison of AROPE with other algorithm like ROPE, Interior-Point Method (IPM) and GA was performed on theoretical function like Rosenbrock and Rastigin function. This comparison was also carried out on hydrological model WaSim-ETH. The Paper is well written. But it does not bring very new contribution. It can be very good research letter supplementing Bardossy and Singh 2008 paper.

Comments on the scientific issue are given below:

Page 2424 Line 7 “these methods. . . . . .” Could you please be specific which methods?

Line 10 need to give references

Line 15 Bardossy and Singh 2008 say Robust parameter estimation algorithm as ROPE, So please use ROPE in whole paper instead of ROPEMC

Page 2425 Line 10 more recent references is missing

Page 2427 Line 7 -13 should be in “ “ or please change the wording

Line 15 What does mean by robust and how deep member can be representative for the whole set. Please explain with some practical example

Line 19 -20 . . .set of parameters. . . it can be set of parameters of any model? Line 20 “the estimated result are very promising” This sentence is not very, author is talking about which result, be clear.

Line 14 to 25 This paragraph need some clarifications and need to rewrite.

Page 2428 Line 3 24 flood events, why 24 events and how was it selected

Line 4 please remove ‘model’

Line 10 ‘a’ == “area”

Figure 1 and figure 2 is not mentioned anywhere in write up.

Line 18 need to be rephrased

Please provide total number of parameters of the model and its range as a table. Author calibrated only three parameters of this model, Is there any specific reason? It will be interesting to see the result when more number of parameters are used for calibration.

Page 2430

HESSD

8, C1242–C1245, 2011

Line 24 Need to be rephrased

Page 2431

Depth function have to fulfill some specific properties, What are those properties and what is there physical meaning.

Page 2433

Line 3 estimate == identify

Algorithm 5.1 3. repeat. . . . . .What to repeat 5. Qn Point 7 and 8 can be combine

Page 2434

Line 6 Author got problem while applying the later part of ROPE algorithm, Could you please demonstrate with some results with explanation how and why was the problem.

Page 2436 As we increase the iteration performance increases and author advocated that model could be gone up, but authors should notice that increase in performance after certain iteration is very marginal, hence calibration can be easily stopped at this point. So I cannot see what the problem in stopping criterion in ROPE algorithm is ?

Page 2436 Splitting data in to calibration and controlling set to control the over fitting problem, but it will be very subjective on the quantity and quality of the data used for this purpose. So how can you say it is robust stopping criterion, where as in ROPE algorithm we can stop when there is no much improvement on the performance from one iteration to other, It does not depends on the selection of data.

Page 2437 In agrotithm point 3. Repeat —what to repeat

Page 2439 Line figure 9. . . a similar figure from ROPE is require to make the comparison.

Page 2439 Line 12 There is not much difference in the result of ROPE and AROPE, how can you justify AROPE have superior result? Line 20 to 24 it is not very clear what

HESSD

8, C1242–C1245, 2011

author want to say, so please rephrase it

Page 2440 Lines 19 please rephrase the sentence

Page 2441 Figure label 11 is used before figure 10 Line 13 it can be seen from figure low depth parameters have also higher performance, how can justify Line 25 " data depth to . . . . . " please give more explanation why

Page 2443 Line 15-17 it is not clear, please rephrase the sentence Since you have only three parameters, a 3-D figure instead of figure 12 will give more readability. Line 25 " it is evident . . . " It is not the quantity of the data but it is quality and information contain of the data. Line 10-15 it is not very

Page 2445 Uncertainty issue has not been discussed, so this paragraph needs more explanation. Line 18 "this paper present a depth based. . . .considering uncertainty" Could you please explain how does it consider the uncertainty.

Page 2446 Line 3-7 this point is not demonstrated properly in this paper. So it can not conclude.

Page 2455 Formula for NS has typo error.

Page 2457 Table 6 it would be nice to see the result from ROPE algorithm and compare with other. This table need more explanation.

Figure 8 "upper" ==left, "lower" = right Page 2470 Please enlage this figure, it will be nice to plot a similar figure for ROPE algorithm Page 2471 Hdepth ==? Page 2472 SROPE ==? It will be nice to put result from ROPE as well.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 2423, 2011.