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Hydrology and Earth System Sciences Discussions

Interactive comment on "Coupling Green-Ampt infiltration method and two-dimensional kinematic wave theory for flood forecast in semi-arid catchment" *by* L.-L. Wang et al.

Anonymous Referee #1

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The authors developed a grid-and-Green-Ampt-and-two-dimensional-kinematic-wave-based distributed hydrological physical model (Grid-GA-2D) model, which couples the Green-Ampt infiltration method with the two dimensional overland flow routing model based on kinematic wave theory for flood simulation and forecast.

The authors aimed in the course of flood forecast development to consider factors such as the soil moisture redistribution at hillslope and depression water storage on overland flow processes.

This reviewer, however, has a few comments about this paper.

1. The reason that one dimensional kinematic wave model is applied to substitute Muskingum-Cunge mehtod in Grid-GA model needs to be given, or the advantage of the kinematic wave model needs to be discussed. If possible, the authors should conduct a comparative study of the Grid-GA model with Muskingum-Cunge method and the model with kinematic wave model.

2. Page 8046, line 15, "the parameter of the Shanbei model and the Grid-GA model were calibrated by the SCE-UA method. . .". What are the specific calibrated parameters? Tthe paper seems to be vague, even in Table 1, it is not noted in the text.

3. How is equation (18) obtained? Please make sure the expression is correct. Another question is how can you tell it helps the calculation of h.

4. There are some minor errors in equation (20) and Figure 4. The reference or deduction need to be added for equation (11). The expression of "tth" should be "t th" or else . . .. .The content of Fig .6 and Fig. 7 is the same and needs to be corrected.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 8035, 2011.