Hydrol. Earth Syst. Sci. Discuss., 5, S1672–S1673, 2008
www.hydrol-earth-syst-sci-discuss.net/5/S1672/2008/

Hydrology and Earth System Sciences Discussions

Interactive comment on "A modelling approach to assess the hydrological response of small Mediterranean catchments to the variability of soil characteristics in a context of extreme events" *by* C. Manus et al.

A. Gelfan (Editor)

hydrowpi@aqua.laser.ru

Received and published: 1 November 2008

The paper presents a modeling approach aiming "to gain new insight into the processes controlling runoff generation at regional scale"; (page 3). The rainfall-runoff model combining the Richards equation approach to simulation of the effective rainfall with a very simple method of runoff discharges calculation was applied by the authors for 4 small (less than 10 km2) ungauged catchments in Gard region, France. The study was focused on the single flash-flood event occurred in September 2002. The model

was applied without any calibration, in particularly the soil hydraulic parameters of the Richards equation were derived from the available soil database. To validate the model, the authors compared the maximum specific discharges simulated for 4 catchments with the specific discharges estimated for several small nearby catchments on the basis of the post-event investigations including investigations of water level marks and interviewing witnesses. Spatial distinguishing between the different runoff generation mechanisms (Horton process and Dunne process) was revealed within the considering basins on the basis of simulations

General Comments The results of the model validation, as they presented in the paper (Figure 8), are deficient to get a reader any idea on the applicability of the model to the main problem examined in the paper, namely influence of soil spatial variability on catchment response to extreme precipitation. In essence, Figure 8 shows that the simulated maximum specific discharges for the considered catchments lie within the wide range of the specific discharge values estimated for several nearby catchments. For me, these results don't say anything about the model capability for the small basins under consideration, not to mention about using of these results for regional scale. Consequently, I can not give credence to the authors’ conclusions which are based on untested simulations. I consider the presented study as incomplete one and my suggestion is to carry out validation of the model using observations in gauged basin(s). Leaving aside some less serious remarks (for instance, I consider as incorrect the method of reducing of hydraulic conductivity and soil porosity because of rock fraction (page 13)), I suppose that the aforementioned remarks are a matter of principle and relate to the basis of the approach presented in the paper. In spite of the paper addresses relevant scientific problem within the scope of HESS, however scientific methods and assumptions which are suggested by the author for solving the problem were not validated, and I can not recommend the paper for publication in HESS.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 2687, 2008.

HESSD

5, S1672–S1673, 2008

Interactive Comment