

## ***Interactive comment on “Improving runoff prediction through the assimilation of the ASCAT soil moisture product” by L. Brocca et al.***

**Anonymous Referee #1**

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### GENERAL COMMENTS

The authors demonstrate in this paper that coarse resolution satellite observations of soil moisture can be of high interest if assimilated in a rainfall-runoff model. This is illustrated through a thorough analysis that involves not only the comparison of the, so called, soil wetness index retrieved from ASCAT with the saturation degree derived from a rainfall-runoff model, but also further experiments. These are also aimed at verifying the effects of a possible uncertainty in the parameters, in the data or in the initial soil moisture conditions of the model.

This paper is generally well written. The authors, after a complete overview of the extant literature, point out clearly the original contribution of this study that is the as-  
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simulation of coarse resolution satellite data into a model with the aim of providing improvement in runoff prediction.

The results showed in this study follow from careful analysis, unfortunately carried out with a limited number of hydrological catchments and few years of simulation. In fact the authors themselves state that this is only a first investigation, so further analysis are essential and should be included in future work. I have got the following few minor remarks.

#### Specific comments

1- In the paragraph 2.1 the MISDc is introduced as a continuous rainfall-runoff model, but it is also stated that the model was developed for the simulation of flood events. Later in the paragraph 5.1 the authors say that “all the results are shown only for flood events”. Could you please add few words to solve this question.

2- If I do understood well, SWI is directly linked to the characteristic time length T; I think it should be better to complete the explanation (of paragraph 5.2) on how you obtained the parameter T.

Page 4126 Ln 18 and page 4128 Ln 28 SER should be ASS

Page 4126 Ln 23 is  $\sigma_{mod}$  the same of  $\sigma[SD_{mod}]$  of the eq 3?

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