

## ***Interactive comment on “High-resolution satellite-based cloud-coupled estimates of total downwelling surface radiation for hydrologic modelling applications” by B. A. Forman and S. A. Margulis***

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general comments: a very clearly presented description of the cloud-coupled model to estimate downwelling surface radiation. The algorithm is well explained and therefore easy to understand. A comparison with in situ measurements is presented to show the performance, also the connection to the application for hydrology is explained.

specific comments:

1. There exist two products within the LAND-SAF (Land surface analysis - satellite ap-

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plication facility; this is an international project sponsored by EUMETSAT) which deal with the problem: DSSF (downwelling surface short-wave radiation flux) and DSLF (downwelling surface long-wave radiation flux) These products, based on SEVIRI data of Meteosat satellites, are calculated operationally for certain regions of the globe (but NOT for North America). Although they differ in the data which are used and the geographical region from the model presented in the manuscript they should be mentioned.

2. In chapter 2.3 it is mentioned that the product MOD43 (black-sky and white sky albedo) is used. This product is available in 16-day interval. It seems that this could cause problems in regions/seasons of melting snow. Although it might be no problem for the area selected here, such a coarse temporal resolution leads to limitation in global use. It would be nice if it this would be mentioned.

technical corrections:

p.3041 line 11 "... at 4 km/h resolution" should be replaced by "... at a spatial resolution of 4 km and a temporal resolution of 1 h"

p.3043 line 21 "Bloschl" should be replaced by "Bloeschl" p.3071 line 12 same as above

p.3053/3054 equation (3)  $\alpha$ -dif is not explicitly declared

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