**Atmospheric
Chemistry
and Physics
Discussions**

Interactive comment on "Simulating 3-D radiative transfer effects over the Sierra Nevada mountains using WRF" *by* Y. Gu et al.

Anonymous Referee #2

Received and published: 3 October 2012

This paper implemented a new surface solar radiation parameterization based on deviations between 3-D and conventional plane-parallel radiative transfer models into the WRF model to simulate the solar insolation over the mountain/snow areas of Sierra Nevada in the Western United States. It examines the impact of the spatial and temporal distribution and variation of surface solar fluxes on land-surface processes.

In general, this paper is well written, the results are original and well presented. I recommend the publication of this paper after addressing the following minor comments.

Minor Comments:

Figures: The map figures (1-5) are hard to visualize. It will be better to have maps of the bigger area, with the study region marked up and zoomed in.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

Page 19902: Equation (1). What is the definition of Ct? Is it the related to the size of the mountains?

Page 19903: Second paragraph. I think the authors also need to discuss the seasonal variation since it will affect the position of the Sun and thus the solar zenith angle μ.

Page 19910: first paragraph. I don't understand why higher elevations have a maximum reduction at 2pm, while at lower elevations the maximum reduction is at 10am or earlier? If it's caused by geometry, a more detailed explanation is needed.

Page 19911: Is LSM defined in the previous text?

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 19897, 2012.