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Interactive comment on "The Guadalfeo Monitoring Network (Sierra Nevada, Spain): 14 years of measurements to understand the complexity of snow dynamics in semiarid regions" *by* María J. Polo et al.

Gascoin (Referee)

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This paper introduces two data sets to study snow cover dynamics in the Sierra Nevada, Spain: (i) meteorological data from five automatic weather stations since 2009 (ii) fractional snow cover area and snow depth at two (to be checked - see below) high elevation sites from time lapse cameras.

Many semi-arid and Mediterranean regions rely on snowmelt for water resources supply. However, there are few monitoring networks like this one in semi-arid mountain

regions. As a result there is often a "wet bias" in the evaluation and development of snow and hydrological models. Therefore, the publication of the Guadalfeo monitoring network data should be applauded. In addition, the records have almost no gaps which denotes the careful maintenance of the stations over these years (Fig. 3), despite the remote location of some stations.

The paper reads well and I have only two major comments:

- I concur with the first referee that the meteorological data should be provided at the hourly time step at least (currently only daily data are available in Pangaea). This is important because an objective of this special issue is to gather evaluation data for atmospheric circulation model in complex terrain and specifically their ability to resolve the diurnal cycle of surface level meteorological variables. In addition, sub-daily fluctuations of wind, radiation, temperature and humidity are required to run an energy balance snowpack model. Last, daily air temperatures does not allow an accurate determination of the precipitation phase (snow vs. rain). I also agree that the authors should make clear if a snow undercatch correction was applied.

- In the second repository there is only snow depth and snow fraction from camera C2 (https://doi.org/10.1594/PANGAEA.871706), whereas the abstract states that data from two time-lapse cameras are provided. In the main text three time-lapse cameras are presented (e.g. Tab. 2). Maybe this is a mistake but I encourage the authors to share all the data from cameras C1 and C3 since they have a much larger coverage than C2 (which covers only a plot of 30 m by 30 m). In addition I encourage the authors to share the snow cover *maps* (Fig. 5) and not only the time series of the average snow fraction. This would be very useful for the evaluation of remote sensing products. If the authors do not want to share the snow cover maps then at least a shapefile of the imaged area should be provided for each camera.

Minor comments

P1L24: cause, not show

P1L27: any reference to justify this statement?

P2L5: eastern rather that western Pyrenees

P2L6: Mount Lebanon and Anti Lebanon (or Lebanese mountain ranges)

P2L7: a "snow" paper could be cited for each mountain range (see for instance a review by Fayad et al. 2017 in J. Hydrol.)

P2L9: laboratories

P2L9: have, not having

P2L17: I am wondering if we really state that the spatial distribution of snow (what variable by the way?) is more variable is semi-arid regions? Large snow depth variability is also found in temperate alpine regions, but it may be less "visible" than in areas of shallow snowpacks.

P4L5: it is a detail but I do not understand the rationale of this sentence: if the snow influence is damped it should be less interesting for snow studies?

P4L14: specify from which station (or is it from a model run?) this average was computed.

P9L3: it would be useful to indicate the accuracy of the snow depth and snow fraction from the camera data.

P15, Fig 7: how were snow and rain separated from the total precipitation?

P17, Fig 8: can you explain to what conditions relate each "curve"?

I hope my comments will be useful, best regards.

Interactive comment on Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2018-123, 2018.