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Interactive comment on "Snow observations in Mount-Lebanon (2011–2016)" *by* Abbas Fayad et al.

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We greatly appreciate the referee's constructive comments, which will help us improve our manuscript. We will provide a detailed response to every comment once we have received the next reviews, but here we would like to respond briefly regarding the issues in the AWS radiation data and snow course data that were raised by the referee.

1) Thank you very much for pointing us that we provided the raw incoming and outgoing solar radiation data by mistake, instead of the processed data as indicated in the manuscript. The radiation data were flagged using the following classes (0: zero incoming and reflected shortwave radiation measurements; 1: data are correct, albedo test is OK (is between 0 and 1); 2: data do not pass the albedo test; 3: observation bias likely due to frost on the sensor; 4: field obser-

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vations reported that the sensor was not well levelled; and 5: no data). Extracting shortwave data with flag 1 only results in albedo values that are within 0 and 1. We also used visual inspection to check for potential biases arising from snow frost especially when the outgoing shortwave exceeded the incoming SW during winter season. The corrected data is shown in Fig. 1. and can be accessed following this temporal link (https://www.dropbox.com/sh/zs9klzhl55ezdss/AAB-0wgKfHGheMmE05ovmFfpa?dl=0). The data in the public repository will be upgraded with the revised version.

2) The apparent inconsistencies in the snow height (HS), snow water equivalent and density are due to different sampling strategies during a snow course. We provided HS that is the average of the HS measurements collected at 5 meter interval, while SWE and density were calculated from observations at 25-50 m interval along the same snow course (i.e. usually 3-5 observations per snow course). We updated the dataset to add the mean HS at the same locations where the SWE and density were sampled. The measurements are now consistent as shown by the comparison between the density values and the ratio of the SWE to HS ratio (Fig. 2). The density computed by averaging the density values obtained in one snow course is not necessarily equal to the density computed as the ratio of the average SWE to HS for the same snow course. This non-linear effect is exacerbated in cases where the snowpack is high variable in space. The data including the HS from the snow tube version is provided at the following temporal link (https://www.dropbox.com/sh/zs9klzhl55ezdss/AAB-0wgKfHGheMmE05ovmFfpa?dl=0) and will be upgraded online with the revised version.

Interactive comment on Earth Syst. Sci. Data Discuss., doi:10.5194/essd-2017-3, 2017.

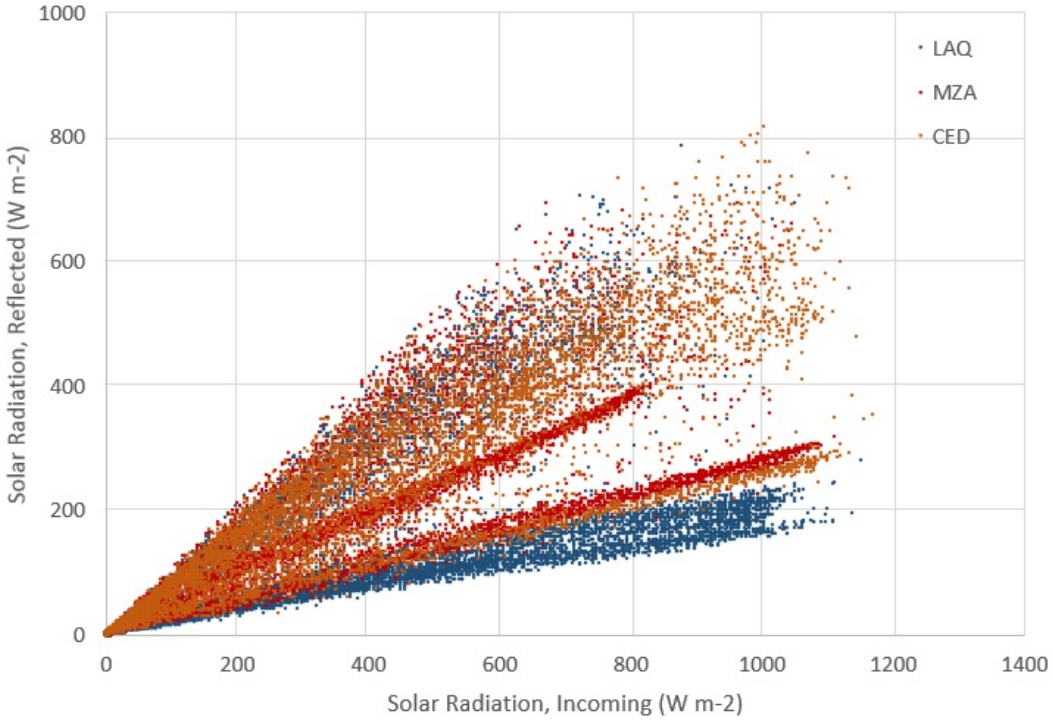

Fig. 1. Comparison of filtered incoming and outgoing shortwave radiation data at the sites

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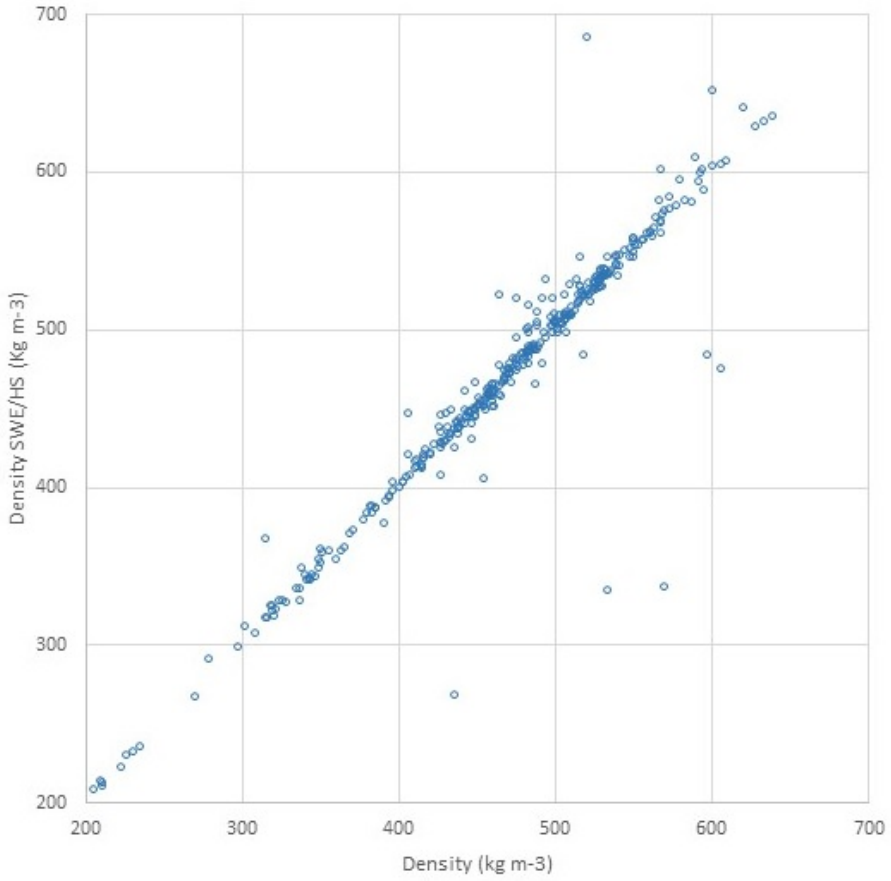

Fig. 2. Comparison of provided and computed snow density from snow core observations