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Interactive comment on “Snow characteristics, distribution and disappearance in a subtropical volcano (Teide, Canary Islands)” by R. Martín Moreno

Anonymous Referee #2

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GENERAL COMMENT:

This manuscript provides some basic insights into the snow characteristics of the highest mountain in Spanish Territory, on Tenerife Island in the Canary Islands. The images and material covered are interesting, and appear to show that physical processes controlling ablation of snow on the highest part of the mountain are comparable to those observed on other high sub-tropical and/or tropical mountains. However, the manuscript does not contain enough new information or quantitative material to warrant publication in *The Cryosphere* in its present form, and the stated goals of the manuscript are not achieved. Though the description of the physical processes thought

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to control snow cover on the mountain is of general interest, further effort to constrain these qualitative observations is required, either through detailed measurements on the mountain itself or a more thorough analysis of regional or larger scale atmospheric data products. Some specific points are raised below to clarify this:

SOME SPECIFIC POINTS:

1. P76, Abstract: The purpose of the manuscript needs to be more clearly defined. It is stated that there is “only 12.7 days of snow per year”. Is this value the average number of days that snow fall? Over what temporal period does this number represent? It is not stated what the duration of snow cover is on the mountain, and of interest, how quickly the penitentes shown in Figure 4 form. If carefully described in the manuscript this could be of interest to readers. On P86, L3 it is stated that “the frequency and size of the snow penitentes in the Teide is (are) decreasing due to the current global warming”. This statement is not supported quantitatively in this manuscript, but could be of interest if carefully demonstrated using data products from the mountain or globally gridded data products.
2. P77, Section 2: A more detailed climatology is required here to provide a background for readers to understand the atmospheric controls on mass gain and loss on the mountain. This leads to Section 3, which in its present form does not provide an adequate climatological context for the region. In particular, its linkages to larger scale atmospheric processes (synoptic to global) need to be more carefully demonstrated, through careful analysis of existing literature or the use of data products. Statements describing long-wave radiation and sublimation are also very poorly constrained in this section.
3. P83: Section 5: It is not clear what the typical duration of snow cover is in this manuscript, despite this being clearly defined as an objective (P77, L12). The motivation for this manuscript and/or its justification is not clear, and Section 5 fails to clarify this. It is interesting that these features exist on a high mountain on Tenerife Island

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but specific details of the atmospheric processes controlling their disappearance are required.

RECOMMENDATION:

This manuscript is not carefully constrained and does not provide new insights into the physical processes controlling snow distribution at the chosen mountain site. For this reason it is recommended that the manuscript is rejected for publication in *The Cryosphere*. However, the observations are of general interest and could provide impetus for future studies, which this manuscript as an online discussion contribution will continue to serve.

Interactive comment on *The Cryosphere Discuss.*, 5, 75, 2011.

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