

Interactive comment on “Measured and modelled sublimation on the tropical Glaciar Artesonraju, Perú” by M. Winkler et al.

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Received and published: 19 September 2008

Sublimation, as this paper demonstrates, is an important factor in mass balance of tropical glaciers that inhabit at least seasonally a dry season. One of the authors explained to me the dynamics of this 24 years ago, this is the best quantification of the process I have seen since. This makes the paper an important contribution that will encourage and inform further work better quantifying the role of sublimation in mass balance. The basic climate conditions that the process occurs under, the impact of surface roughness, and the impact on mass balance are the focus of this paper. Because of the limited nature of previous sublimation studies, we would benefit from additional qualitative and quantitative description of the basic aspects of the process. In particular three critical questions that are addressed, but deserve additional attention

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are:

1. How is surface roughness impacted by the process of sublimation?
2. Can surface roughness be used as an indicator of regions where sublimation is particularly dominant?
3. What are the specific threshold conditions of specific humidity, wind speed and air temperature under which sublimation becomes dominant?

Specific Comments

739-28: Define what a low specific humidity is.

740-1: What is the value of the QI gradient? For sublimation to occur does the gradient have to be negative?

740-20: Is the mean sublimation rate on Kilimanjaro a mean of both wet and dry periods?

741-15: What is known to cause high albedo?

742-20: Would a larger pot size have any impact on the results?

Section 2:3 and 3:2 Are these really needed? It is valid material, but seemed to take our attention from the main point.

749- 6: What is the mean climate conditions on days when sublimation is the dominant consumer of energy. Could be shown in table.

749-10-15: Better identify threshold conditions at glacier surface for sublimation to be key. Again maybe in a table.

750-15: Better define sublimation and f value variation due to wind speed and humidity. This can be done by a greater analysis of the results of Figure 5.

751-15-19: How indicative is surface roughness of the prevalence of sublimation as the

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dominant ablation form? Can this roughness be used as an indicator of such?

Interactive comment on The Cryosphere Discuss., 2, 737, 2008.

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2, S297–S299, 2008

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