

Interactive comment on “Wind tunnel experiments: cold-air pooling and atmospheric decoupling above a melting snow patch” by R. Mott et al.

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This is an interesting paper describing careful wind tunnel experiments of flow over flat and concave melting snow patches. My comments suggest some corrections and request some clarifications. The English writing is good but will benefit from copy editing.

5414, 9 Momentum fluxes were also measured

5414, 15 Clarify in what sense “drainage flows were decoupled from the surface”

5415, 9 A missing reference here: Liston, G. E. (1995). Local advection of momen-

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tum, heat and moisture during the melt of patchy snow covers. *Journal of Applied Meteorology*, 34, 1705-1715.

5415, 15 Burns and Chemel

5416, 15 Perhaps more importantly, high vertical resolutions are required

5416, 25 It is fairly obvious, but neither z nor δ have been defined.

5417, 26 Make it clear that the depth of the concavity is being discussed, not the depth of the snow.

5418 Z_0 is a redundant quantity, being 0 by definition (and might be confused with z_0 by boundary-layer meteorologists). I think it would be more clear to have $z=0$ redefined for each experiment to be the snow surface in E1 or the highest point of the concave surface in E2. How much did the surface change during the experiment, and is it reasonable to assume that most of the melt occurred between rather than during the measurement periods? Why were the measurement periods different for E1 and E2?

5419, 3 Exceeding what threshold?

5419, 9-13 This sentence and Table 2 contain exactly the same information; one of them is redundant.

5419, Equation (1) Either subscripts or conditions are required in the integral to pick out the quadrants.

5420, 9 Table 1 shows ambient temperatures ranging between 8.5 and 14.0 C.

5421, 19 It takes some faith to see “a distinct local wind maximum” in the profiles for E2V1, particularly without an estimate of the uncertainty in the measurements.

Table 1 What heights were used in calculating the bulk Richardson numbers? I couldn't make sense of the values. V in the caption is U elsewhere. Θ in the table is T elsewhere (and it isn't potential temperature). The labels “c = concave, f = flat” are not

C2188

used.

Figure 3 Is there any advantage to having X1 and X2 profiles on the same plots?
Splitting them would remove the need for the complicated and confusing axes.

Figure 4 Theta in the caption is T in the figure.

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