

Minor changes made to final submitted manuscript:

References added to Supplement

Supplement parts numbered: S1, S2 Table S1, Table S2. Referred to as such in the text.

Data availability section added that reads: “*Surface meshes used in this study are provided in the supplementary material (naming convention is site_ddmm.ply). Interactive 3D views of surfaces from site B can be seen at: <https://sketchfab.com/LindseyNicholson/folders/penitentes-on-glacier-tapado-chile>. Processing scripts are available on request.*”

L490: changed “*These values are in line with the roughest values previously published for glacier ice.*” to read “*These values are greater than the roughest values previously published for glacier ice, which are < 0.10 m.*” as this was a mistake.

L256: changed “*and S is the total horizontal area of the surface components above z_d .*” to read “*and S is the total horizontal area of the study site.*” as this was a mistake

Added citations of: Smith, M. W., Quincey, D. J., Dixon, T., Bingham, R. G., Carrivick, J. L., Irvine-Flynn, T. D. L., and Rippin, D. M.: Aerodynamic roughness of glacial ice surfaces derived from high-resolution topographic data, *J. Geophys. Res.-Earth*, 1–19, doi:10.1002/2015JF003759, 2016., as this paper is relevant to our study and was published during the review process of our paper. Citations added at L74, 209, 215, 236 and 499). Reference added to list.