

Interactive comment on “Subglacial drainage patterns of Devon Island, Canada: Detailed comparison of river and tunnel valleys” by Anna Grau Galofre et al.

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We would like to thank the editor for considering this manuscript, and the two reviewers (Stephen Livingstone and Martin Margold) for the very detailed and thorough reviews, as well as constructive criticism. The comments of the reviewers made us particularly aware of the lack of detailed geomorphological characterization of the subglacial channels described, as well as the missing literature relevant to the topic, which hindered the interpretation and purpose of the paper. In response to the comments (see the supplement for our detailed response and relevant references), we added a geomorphological description of the subglacial channels, together with a discussion of lateral

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meltwater drainage vs. subglacial drainage in the channels in consideration. The most significant changes in order of their appearance in the paper are:

1.- Following S. Livingstone’s suggestion regarding the use of the term “tunnel valleys”. We agree that the drainage systems described in this manuscript are considerably smaller and therefore should be referred to as subglacial channels. We also added a table (table 1) that summarizes the main characteristics of subglacial channels and puts our study in the context of the existing literature.

2.- Regarding our lack of consideration of lateral meltwater channels, we added a short subsection and a figure (subsection 4.2 and figure 7) where we discuss the relationship between the direction of the studied channel networks and the topographic gradients and regional slopes. We also quantified the angle between channel direction and regional slope in table 2.

3.- We added a new section, additional figures, and a table (section 5: Detailed morphology of subglacial channels in Devon Island, figures 8 and 9, table 3) where we present detailed field observations, including additional field photographs, and provide a much more elaborate description of subglacial channel morphology. Table 3 now includes a summary of observations for each subglacial network observed in the field as suggested by S. Livingstone.

We list the main comments of each reviewer and our corresponding response in the Supplementary PDF. We would like to thank the reviewers again for their thorough comments, which were helpful to improve this manuscript.

Sincerely,

Anna Grau Galofre, A. Mark Jellinek, Gordon R. Osinski, Michael Zanetti, and Antero Kukko.

Please also note the supplement to this comment:

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<https://www.the-cryosphere-discuss.net/tc-2017-236/tc-2017-236-AC1-supplement.pdf>

Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2017-236>, 2017.