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Interactive comment on "Further summer speedup of Jakobshavn Isbræ" *by* I. Joughin and B. E. Smith

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This paper is a welcome update on the dynamic status of Jakobshavn Isbrae, which is significant both in its contribution to sea level rise, and in the insights that it can provide for the future of the Greenland Ice Sheet. The paper is reasonably well written, and the data presented is new and interesting.

I have read the comments by Mauri Pelto (interactive) and Poul Christoffersen (referee), agree with everything that has been said, and will repeat their recommendations only where they are important or further clarification will be helpful. My own recommendations revolve mainly around the understandability of the paper to a wider audience.

I agree that the discussion is rather too speculative at present and would be improved

by being shorter, less speculative in so many respects, and better focused on the potential for a ten-fold increase in discharge from this glacier (Pfeffer), which should also feature in the abstract. In my view the discussion about potential rates of retreat is rather too led by the 1D presentation of the geometry (Fig. 3) and seems to skate over the 3D nature of the glacier – e.g. as the ice front retreats, are we expecting its width to remain constant? Is the hypothesised 50km "rapid" retreat just along this trough (like some kind of narrow inlet), or would it require retreat or at least considerable thinning of the whole ice sheet in this region? It is this kind of wider conceptual context that is not discussed here and which makes the present discussion too speculative.

Although this is intended only as a Brief Communication, the paper's size, number of figures, and potential impact might have suited a standard article. Therefore I recommend a more normal structure which should include a methods section between introduction and results. This section could draw together the beginning of the results section (which is really methods), expand the discussion of errors between satellite tracks (which is currently not easily accessible to a wide audience), and introduce the concept of fixed-position velocities versus ice-front-referenced velocities (which is important in glaciers subject to significant retreat such as Jakobshavn).

There are inconsistencies and confusions in the discussion of error. Errors in the feature tracking technique really need to be introduced more fully (perhaps by referring to previous papers) to allow the specific problem of errors between measurements from different satellite tracks, and errors arising from non-coincident DEMs, to be properly explained and given context. At present this aspect is only accessible to experts familiar with such data processing. In particular the use of the word 'precision' in this respect is, I think, inappropriate. The differences in measured velocities are not related to the precision of the technique, but to errors introduced in post-processing.

P5463 L1: "the speedup has gradually increased and migrated inland". This phrase conflates an awful lot of dynamic change information, and is conceptually difficult to grasp. Please clarify the language.

P5463 L25: “the velocity is posted in the wrong location”. I know what you mean, but I think many won’t. Even the term ’posted’ is rather too specialised I think. Please clarify.

P5465 L8: “plotted the results along the top of”. Stylistically rather weak. I suggest that you just refer to the figure and make sure that the caption explains the figure layout properly.

P5465 L11: “greater importance” -> “greater importance for this glacier”

P5466 L3: “Additional feedbacks”. This is one of two places in which such feedbacks are referred to, so they really need a fuller explanation. What are the feedbacks, what is their impact, and how might they affect the future evolution?

P5466 L11: The ’high spot’ is only just discernable (actually looks more like a plateau) on Fig 3 so needs a better introduction, a label in Figure 3, and highlight in Figure 1. In general the presentation of surface and depth height data (see Poul’s comments), as well as velocities only along the profile in 1D limits the readers ability to see the whole problem, and this could easily be improved by additional contours on Figure 1 and/or another figure.

P5466 L15: “until it again reaches depths”. Again a bit confusing – how can a terminus reach a depth? I get the picture but overall the language could do with tightening up for a broader readership.

P5466 L25: If gridding artefacts are potentially important here, then this needs to be explained in more detail. You haven’t said much about the surface (or bed) DEM, its resolution or it potential errors so to introduce this here, only in respect of this ’high spot’ is rather confusing. Surely gridding effects can affect each of these data products with potential impact on the rate of retreat either positive or negative. Sorry to be pedantic, but this reads a bit sloppily.

P5467 L7: “trough does not narrow substantially”. Surely this is testable? Once again, a 2D presentation of the bed DEM (and possibly the surface DEM) would really improve

the paper.

Figure 1: Labels almost unreadable. So much more could be presented in this figure. Not up to the usual Joughin and Smith high standards!

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