

Interactive comment on “Increased rate of acceleration on Pine Island Glacier strongly coupled to changes in gravitational driving stress” by J. B. T. Scott et al.

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Thanks for these comments. They give us the chance to clarify some aspects of the paper.

The uncertainty of 20 % is the standard deviation around the mean long-term accumulation rate

Yes of course the resistive stress due to the longitudinal stress gradient would be a good way of putting it. We will write this in future. Rather than being a common misstatement it is just commonly used glaciologist poor shorthand.

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It is true that an R^2 with best fit may not be very informative in this case but that would be true for any calculation of R^2 . With these four data points the R^2 is high even with the errors. We only put the R^2 value in the paper because a previous reviewer requested it. The original version of the paper had the ‘model calculated’ line in the graph instead. It makes little difference which one we put in the graph as we show in the paper the difference between the best fit and calculated values of D is small. We believe due to the large amount of assumptions made the important thing is showing that the data fit this model well rather than worrying about the values of the parameters behind D (These parameters are highly variable as they include A and n from the flow law). What the graph really shows is that the correlation between slope increases and acceleration is above error levels and using a basic first order model this is good enough to explain the inland force balance for the ice stream. More advanced models should still have this important relationship between slope and acceleration as part of them if they want to describe the measured changes on PIG.

Interactive comment on The Cryosphere Discuss., 3, 223, 2009.

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