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The Cryosphere Discussions

Interactive comment on "Monitoring ice shelf velocities from repeat MODIS and Landsat data – a method study on the Larsen C ice shelf, Antarctic Peninsula, and 10 other ice shelves around Antarctica" *by* T. Haug et al.

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The value of being able to utilize low resolution optical sensors to derive velocity fields for large ice caps and ice sheets is tremendous, particularly as a compliment to other more accurate but temporally or spatially limited data sets. This potential is explored in Section 1. Section 3 provides a thorough and careful review of the selected methods to ascertain and maximize the accuracy of the data set. This paper presents a valuable new tool for assessment of ice sheet-ice shelf dynamics, along with important data sets on the flow of Antarctic Ice Shelves. The combination of potential and results, left me

excited.

Specific Comments:

Figure 10 needs a scale, and additional places identified.

Page 47: It is noted that the 4 southernmost streamlines identified in Figure 10 are different from the visible flow features, indicating a change in flow directions. It is suggested that this is due change in flow rate of; Lewis, Ahlmann, Bills and/or Daspit Glacier. This is an important point and warrants further discussion. Figure 4k of Cook and Vaughan (2009) of Larsen C indicates a large terminus change in front of these streamlines, due to a large calving event north of the Gipps Ice Rise in 1986, though it is labeled Gibbs Ice Rise in that figure. Prior to the calving event Larsen C floated free north of Gipps Ice Rise (Cook and Vaughan, 2009). The ice rise had acted as a pinning point prior to that event as evidenced by the large rifts (Skvarca, 1994). Is there anything further that can identify the potential impact of this change in the constraining ability of Gipps Ice Rise and the change in frontal position. In Figure 10 the streamlines from south of Churchill Peninsula and north of Cole Peninsula have prominent flow features that I assume are very much in line with the streamlines. If so this is worth noting specifically.

Page 52: It is noted that one section of the northern portion of Larsen C has accelerated, which part more specifically?

Figure 1 should have additional place locations on the Larsen C image, such as the Jason Peninsula, Churchill Peninsula and Gipps Ice Rise.

An additional table listing the mean and maximum velocity and acceleration of the other ice shelves would be useful. This request is prompted in part from viewing Figure 12 to the eye it seems that Mertz Ice Shelf has the highest mean velocity, Shackleton Ice Shelf is noted as having the highest maximum, and West Ice Shelf a low velocity, yet West appears faster than Shackleton, something is amiss.

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