The Cryosphere Discuss., 3, S1–S2, 2009
www.the-cryosphere-discuss.net/3/S1/2009/


The Cryosphere Discussions



# *Interactive comment on* "A full-Stokes ice flow model for the vicinity of Dome Fuji, Antarctica, with induced anisotropy and fabric evolution" *by* H. Seddik et al.

**M. Pelto**

mspelto@nichols.edu

Received and published: 29 January 2009

The following is less a review of the paper, than a series of questions that should be further explored to help explore further implications of the model and comparison of the model to core observations.

The similarity between Figure 6 and 8 is striking. Is there a quantitative measure of the relation between the surface velocity and the anisotropic eigen value. The similarity between Figure 2 and 6 is also noteworthy, providing a good indication of the greater correlation of surface velocity with surface slope, versus with basal topography. This suggests to me that the anisotropic depth profile must vary significantly along a top to

bottom of the diagram flow line from Dome Fuji summit over the bed topographic high to the bottom edge of the figures. If I am wrong explain why, if not explore this idea further.

Smith et al. (2006) explored the development of surface features and anisotropy that allowed determination of areas of sliding. Are there surface textures on Dome Fuji that can be used in a like manner to validate the model results or explore the efficacy of using surface features?

13-15: The slope of the layering deep in the core is noted, up to 50 degrees, and that the slope of the layering does change rapidly. Thorsteinsson and Waddington (2002) comment on folding in strongly anisotropic layers near a dome, is this mechanism applicable to the results you model or observe? If so what are the implications.

14-1: The paper could be strengthened by an expanded comparison of model results to Miyamoto et. al., (2007) examination of anisotropy in the Dome Fuji core.

The similarity between Figure 3 and 10 is obvious and noted in the paper. What is the inverse correlation between ice depth and basal temperature?

---

Interactive comment on The Cryosphere Discuss., 3, 1, 2009.