Melt-Induced Deformation in an Isothermal Snowpack

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Abstract

Borehole Results

Figure 4. Graphical representation of creep March 13 – 19, 2004. Creep rates increase as temperature increases. The upper layers of the snowpack respond to increased temperature more rapidly than underlying layers. On days 77 and 78 there is apparent upslope motion (slip) in sensor 3 resulting from the ability of the potentiometer spring to overcome the shear strength of snow near the surface.

Figure 5. Creep March 13 -19, 2004 corrected for slip in sensor 3. The onset of movement shown by sensor 3 (snow surface) corresponds very well to warming temperatures.

Figure 6. Total creep per day vs. a calculated temperature index (cumulative daily average of temps above 0°C) shows a relationship between cumulative heating and overall snowpack deformation. However, the correction depicted in the previous graph is illustrated by the change in slope at point three. The correction may underestimate creep occurring on days 77 and 78 by assuming periods of no movement during slip in sensor 3. A more accurate representation would probably show a steeper slope between points three, four, and five.