

# **A Dilatant Till Layer Near the Onset Region of Bindschadler Ice Stream: Implications for the Onset of Streaming Ice Flow**

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Analysis of the seismic reflector along the ice-bed interface has proven to be a useful tool in identifying a meters-thick dilatant till layer near the onset region of Bindschadler Ice Stream. The amplitude versus offset (AVO) technique measures how the amplitude of a reflection changes with source to receiver offset (or angle of incidence of the seismic wave relative to an interface). We can estimate the properties of the bed beneath the ice from this amplitude variation. The most notable change is a 180 degree phase shift of the basal reflection at intermediate angles. The incidence angle at which this phase shift occurs can be used to better constrain the impedance contrast between the ice and its underlying bed. We suggest that a dilatant and possibly deforming till layer is present in the upper reaches of Bindschadler Ice Stream, which may be closely linked to the onset of streaming ice flow.