



## **Concentrated deformation revealed by englacial seismic reflectivity - Jakobshavn Isbræ, Greenland**

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Jakobshavn Isbræ highlights the uncertainty surrounding the role of ice dynamics in ice-sheet decay and sea level rise – Greenland is thinning around the margins, and Jakobshavn has recently experienced large accelerations in flow speed. Here we present active-source seismic data imaging the internal structure upstream on Jakobshavn Isbræ, providing an unprecedented view of the mechanisms that enable the fast flow of this glacier. These high-resolution reflection seismic data reveal concentrated internal deformation. Abundant englacial reflectivity occurs for approximately half the thickness of the ice (the lower half), and disruption of the englacial reflectors in the lower 10–15% of the ice-thickness indicates concentrated internal-deformation. These depths correspond to the higher impurity-content ice from the Younger Dryas and Last Glacial Maximum to Stage-3. We conclude that the reflectivity results from contrasting seismic velocities due to changes in the crystal orientation fabric of the ice, and suggest that these fabric changes are caused by variations in impurity loading.