

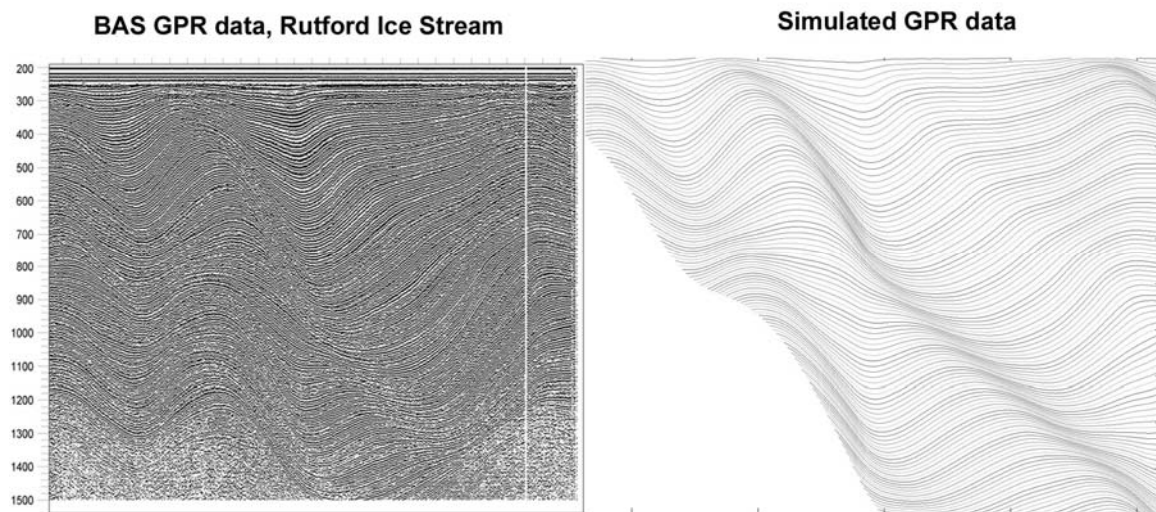
Influence of ice dynamics in WAIS tributaries on firn layer stratigraphy

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Last year we¹ showed a strong correlation between C-band RADARSAT image radiometry and ‘folding’ in the near surface firn stratigraphy measured by high frequency ground penetrating radar (GPR). The data demonstrate that the linear features in the C-band imagery, which are often referred to as ‘flow stripes’, are accompanied by cross-flow layer folding such that bright ‘stripes’ suggest low snow accumulation and dark ‘stripes’ suggest high accumulation. This is consistent with the darker radiometry often associated with dips in the surface elevation where one expects, and observes, higher accumulation. However, for these flow stripes neither the height nor slope variation across the flow stripes appears to explain the apparent accumulation variation, suggesting that the accumulation pattern may be modulated by stresses associated with flow.

In an attempt to learn more about how ice dynamics in tributaries and ice streams affect near surface GPR stratigraphy, a simple model was developed to simulate isochronal firn layers. The model is 2-dimensional, along-flow and vertical, and uses surface velocity and relative accumulation as input. A comparison between actual and simulated GPR data from the Rutford Ice Stream² has shown that layer patterns can indeed be simulated in this straightforward manner. We explore other data from WAIS ice streams in the hope that it may be possible to observe past velocity changes.



¹ *Fast-flow signatures on Kamb Ice Stream*, H. Conway, L. Gray, E. King, F. Ng and B. Smith, WAIS 2004

² GPR data collected for BAS by Dr. J. Woodward now at Div. Of Geography, Northumbria University UK