









- Motivation
- Scientific Question
- Methods
- Results / Discussion
- Conclusion







Those are the slides for the accompanying video.









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Suggested Processes:

- Changing subglacial hydrology
- **Elastic & Viscous stress transfer**
- Variable ice-shelf buttressing
- **Ephemeral grounding**

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Does ice-flow modulation originate on the ice stream or in the ice shelf and if so by which process?











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- Instrumentation of Priestley Glacier
- >Terrestrial Radar Interferometer
- >GNSS, Tiltmeters, ApRES

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- **Terrestrial Radar Interferometry**
- > Acquisition every 3 mins
- > ID Flowfields every 3 hours
- > Tidal flexing over 12 h every 3 mins
- Data Analysis with PCA

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Priestley Glacier (Nansen Ice Shelf)

- $> \sim 160 \text{ ma}^{-1} \text{ mean velocity}$
- > ~ I km ice thickness at GL
- > ~ laterally tightly constraint

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Grounding-zone flow variability of Priestley Glacier, Antarctica, in a diurnal tidal regime — Slide:

14





















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5 km

- > ~ TRI detects ice flow patterns
- > ~ Sensitive to viewing geometry
- > ~ Substantial flow variability

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Velocities TRI & GNSS

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>TRI — GNSS comparison works.







Differential TRI & GNSS



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Emmy Noether-



R. Drews, C.T.Wild, O.J. Marsh, W. Rack, T.A. Ehlers, N. Neckel, V. Helm: Grounding-zone flow variability of Priestley Glacier, Antarctica, in a diurnal tidal regime — Slide: 19

Horizontal components do not (always) average out during double - differencing Motivation

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PCs quantify upstream decay length and boundary of tidal flexing







Emmy Noether

Ice-shelf displacements has a semi-diurnal component for diurnal ocean tides.



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- Tidal ice-flow modulation decays linearly over > 10 km upstream of grounding line
- Variability occurs in all three dimensions and does in general not cancel during double differencing.
- Horizontal flow is modulated on semi-diurnal time scales (in a diurnal tidal regime) which is consistent with flexural softening of ice-shelf shear margins
- Grounding line is pinned and shows little tidal grounding line migration
- (There is evidence for a ephemeral fulcrum at the grounding line)









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