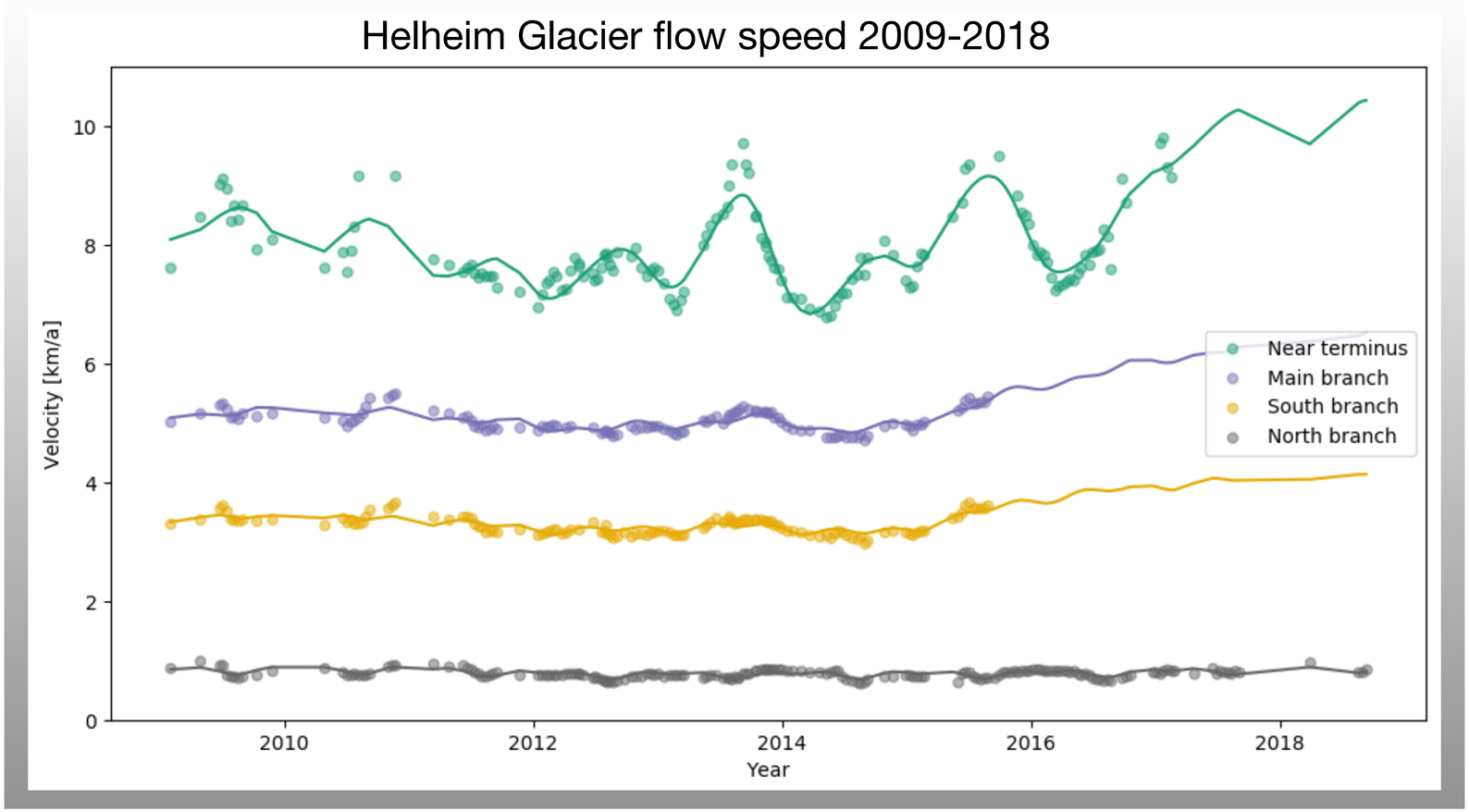
We are extracting and analyzing dense velocity time series on Greenland outlet glaciers.



What can we learn?

-Upstream propagation speed of terminus perturbations
-Dynamic distinctions between glacier branches
-Distinguish physical mechanisms with different temporal signatures

What is new about the method?

-Continuous time-dependent surface velocity & elevation change fields, using generic temporal basis functions (Riel et al. 2018)

What kind of data is available?

-Public ArcticDEM surface elevations and MEaSUREs ice surface velocities

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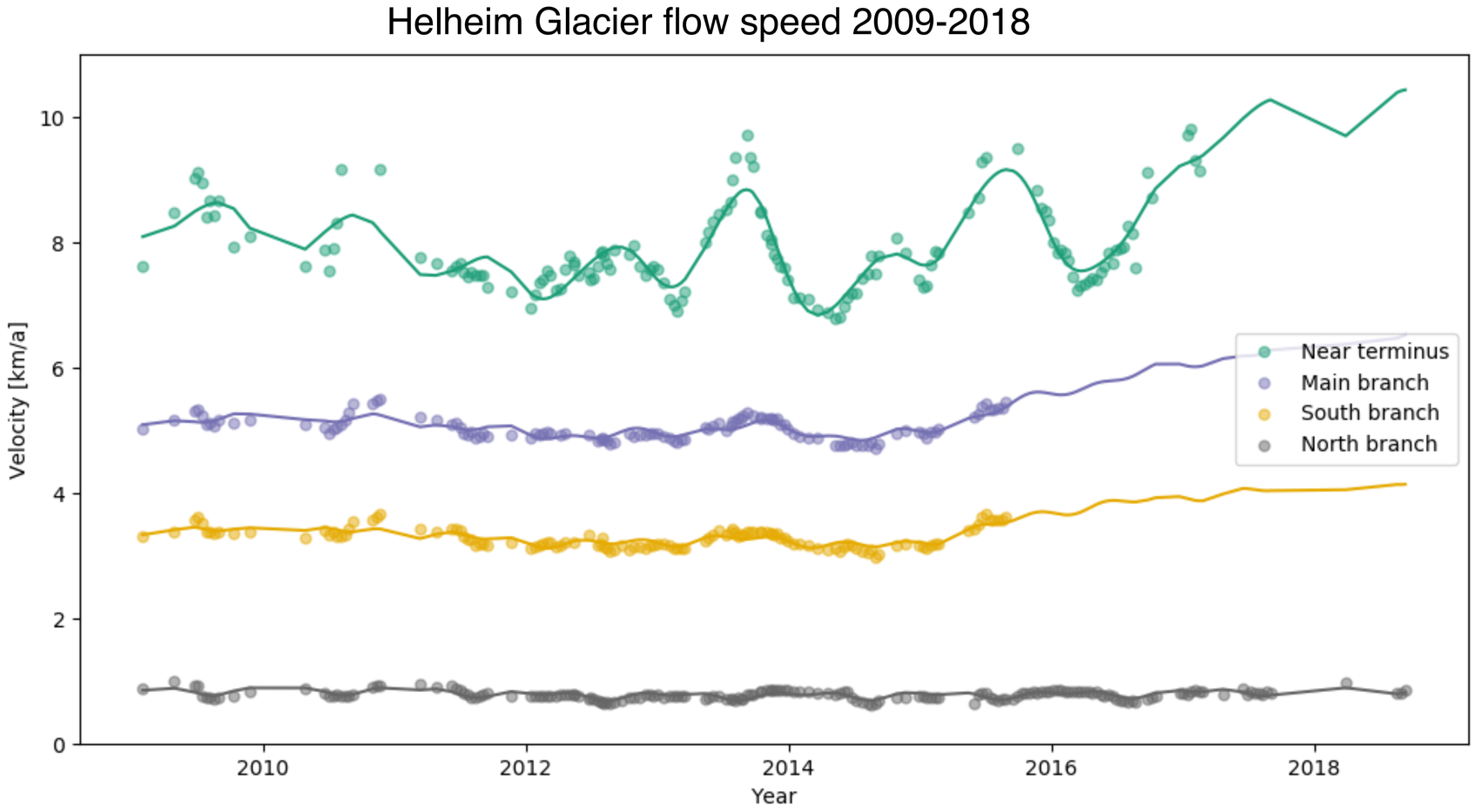
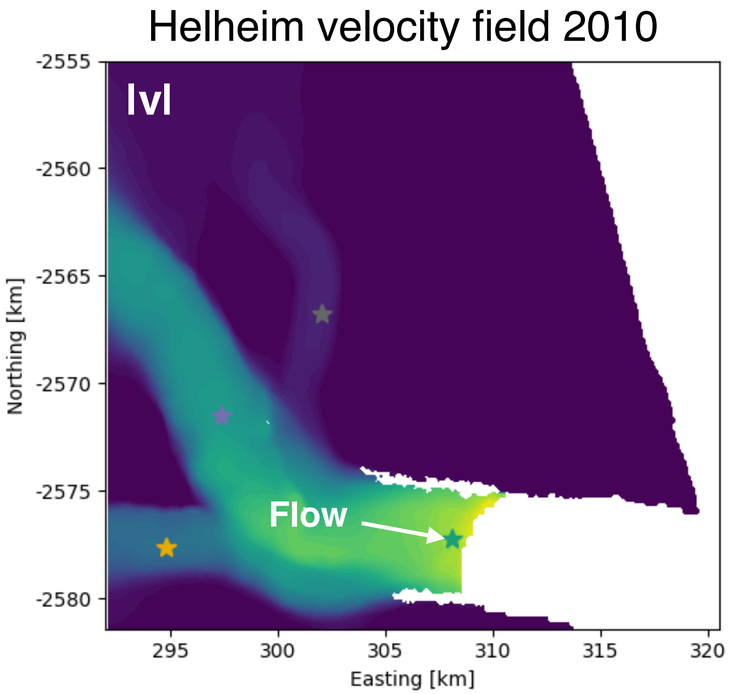
Example: on Helheim Glacier, dynamics of two large branches clearly distinct from a smaller one.





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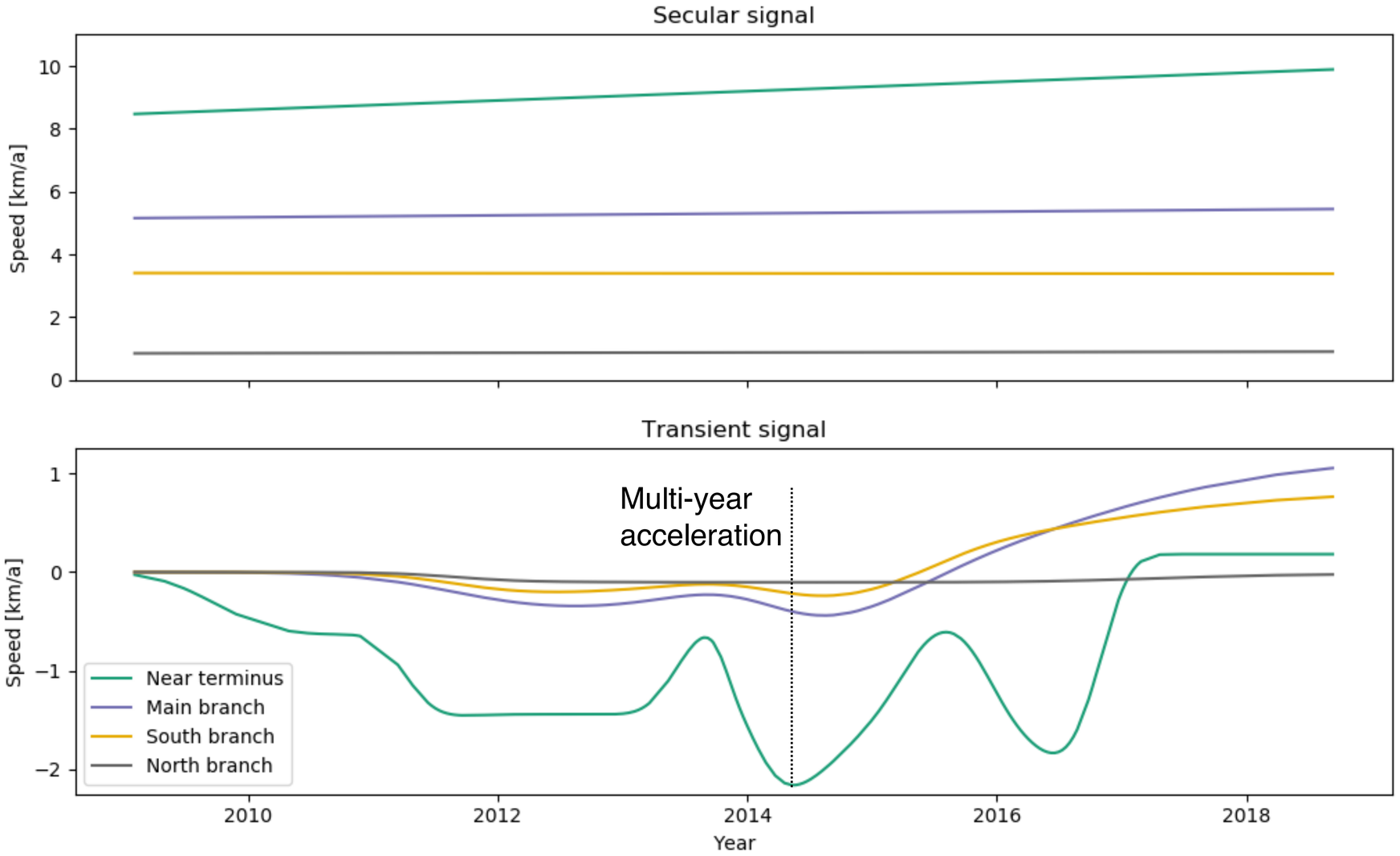

- Secular & transient signals very large near terminus (as we might expect)
- Multi-year acceleration seems to initiate at terminus
- Small northern branch much less “active”

Work in progress - please contact us to discuss!

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Public Python module

Under active development and testing—
check it out on GitHub

Manuscript in prep: Riel, Minchew & Joughin

Applies method to Sermeq Kujalleq;
analyses phase velocity of kinematic waves
propagating upstream from terminus