Surface velocities of the Tibetan Plateau from Sentinel-1 synthetic aperture radar

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Poster

Science objectives:

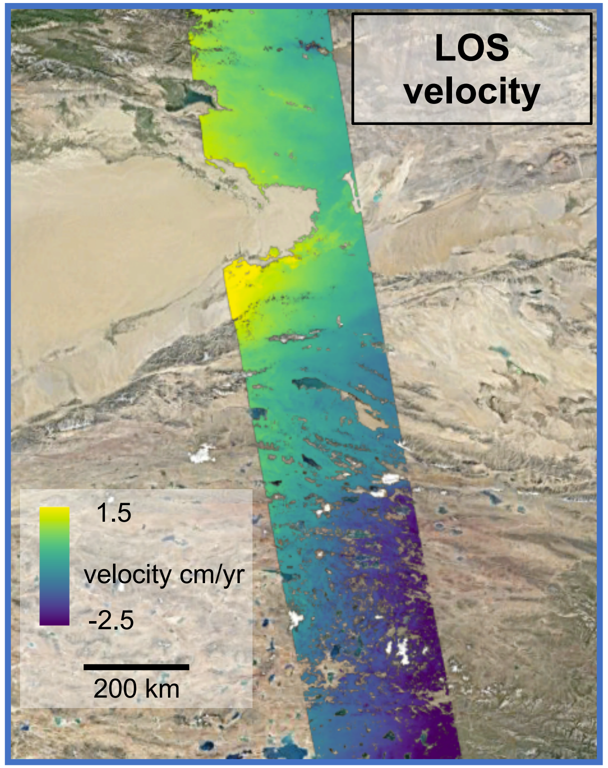
- Map deformation from the India-Eurasia tectonic collision
- Resolve active layer and permafrost processes resulting in periodic surface motions

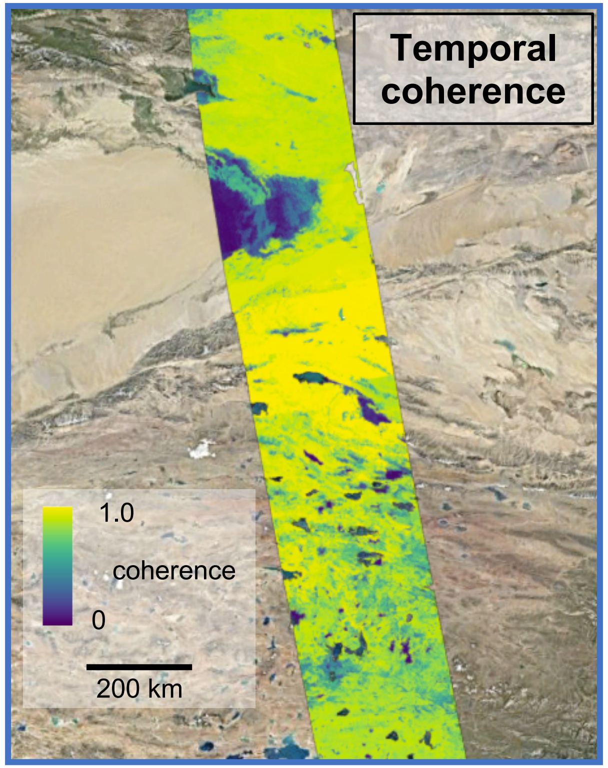
Analysis methods:

- Sentinel-1 radar satellites (ESA)
- ARIA processing pipeline
- MintPy timeseries analysis

Findings:

- Tectonic faults are marked by velocity gradients
- Active layer processes contribute cm per year surface movement
- Redundant measurements of radar phase do not always agree





Surface velocities and coherence:
(Left) Line of sight (LOS) surface velocity map of Tibet, masked by temporal coherence. Velocities calculated from 312 interferograms over 4+ years of ESA Sentinel-1 acquisitions.

(Right) Temporal coherence map for same data set.

Significance:

- Our results will help determine the mechanical properties of earthquake faults
- Active layer processes help reveal the impact of seasonal effects and climate change on the region
- These methods will help develop processing routines for the upcoming NASA + ISRO NISAR mission