

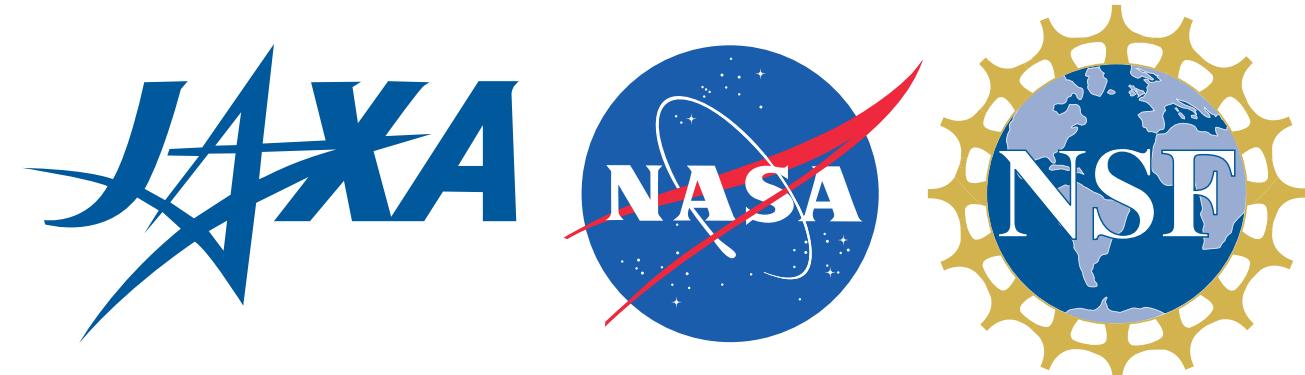
Monitoring volcanic unrest in Kyushu, Japan with time series InSAR

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1- Summary

Motivation: Volcanoes deform in various ways: pre-eruptive uplift due to pressurization caused by magma accumulation, co-eruptive subsidence and/or followed by post-eruptive deflation due to the cooling of magma reservoir. A key challenge for volcanological science and hazard reduction and management is that **only a fraction** of the world's volcanoes are effectively monitored.

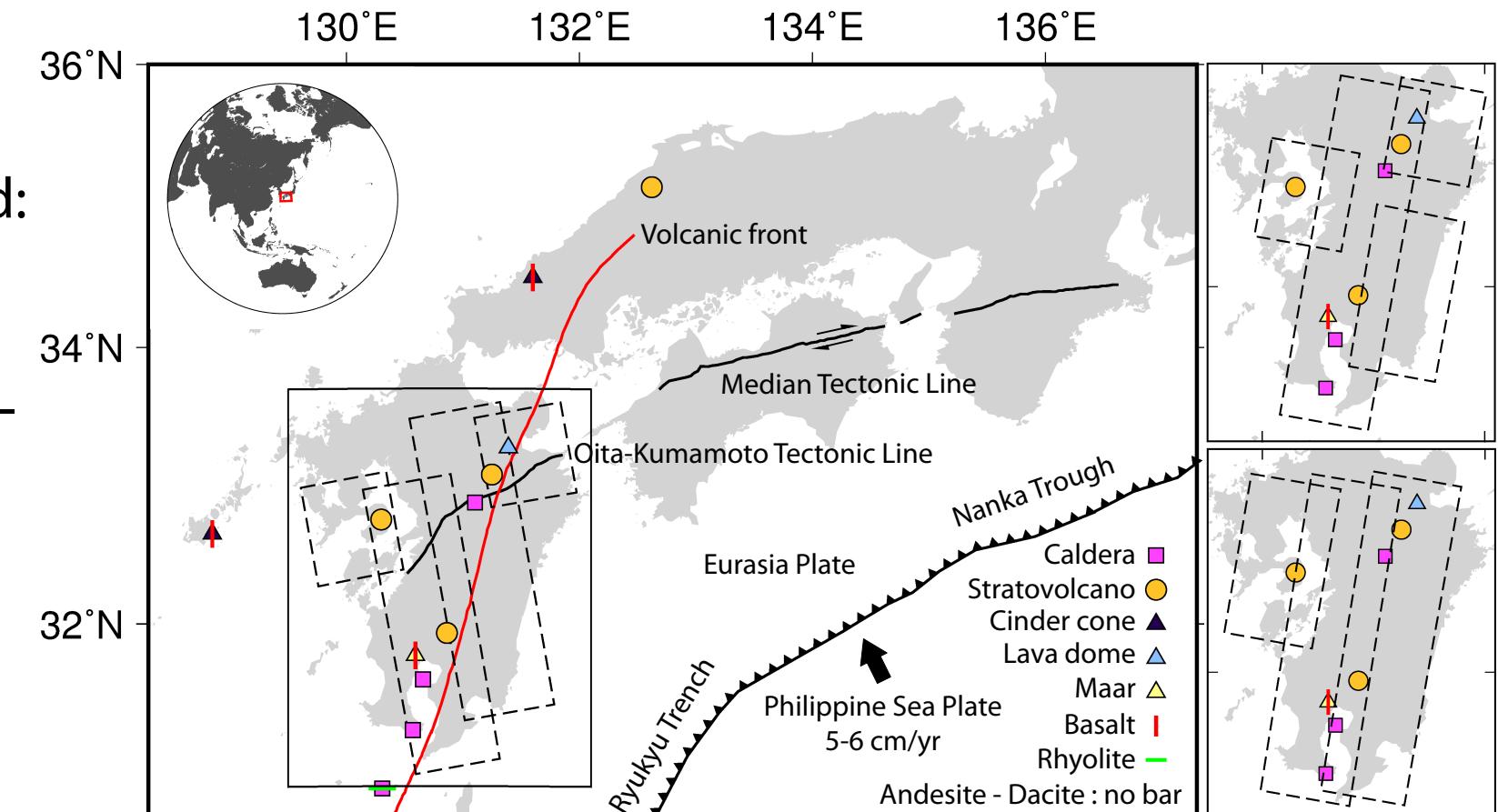
Study Area: Kyushu, SW Japan

Technique: InSAR (Radar Interferometry) time series analysis

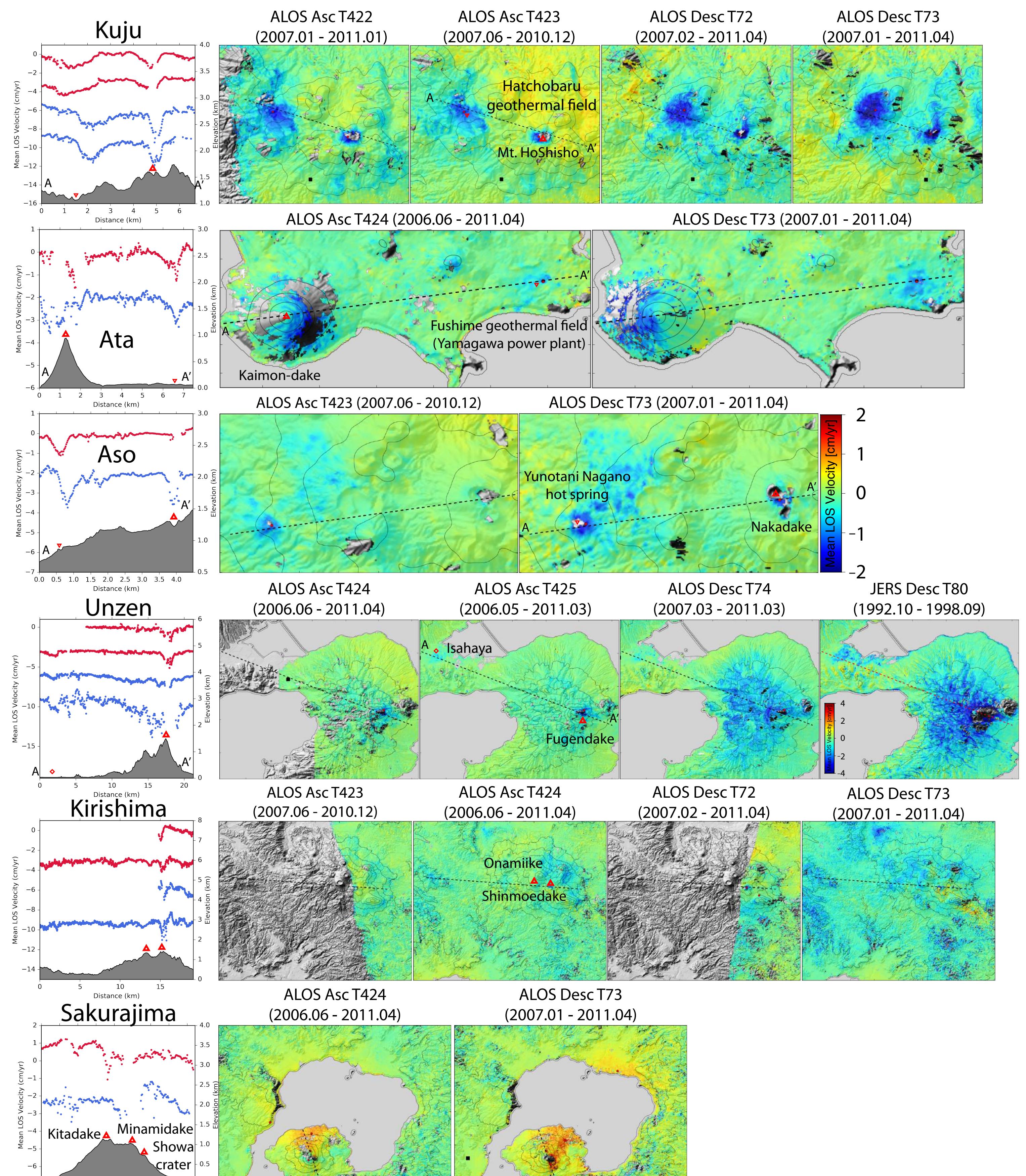
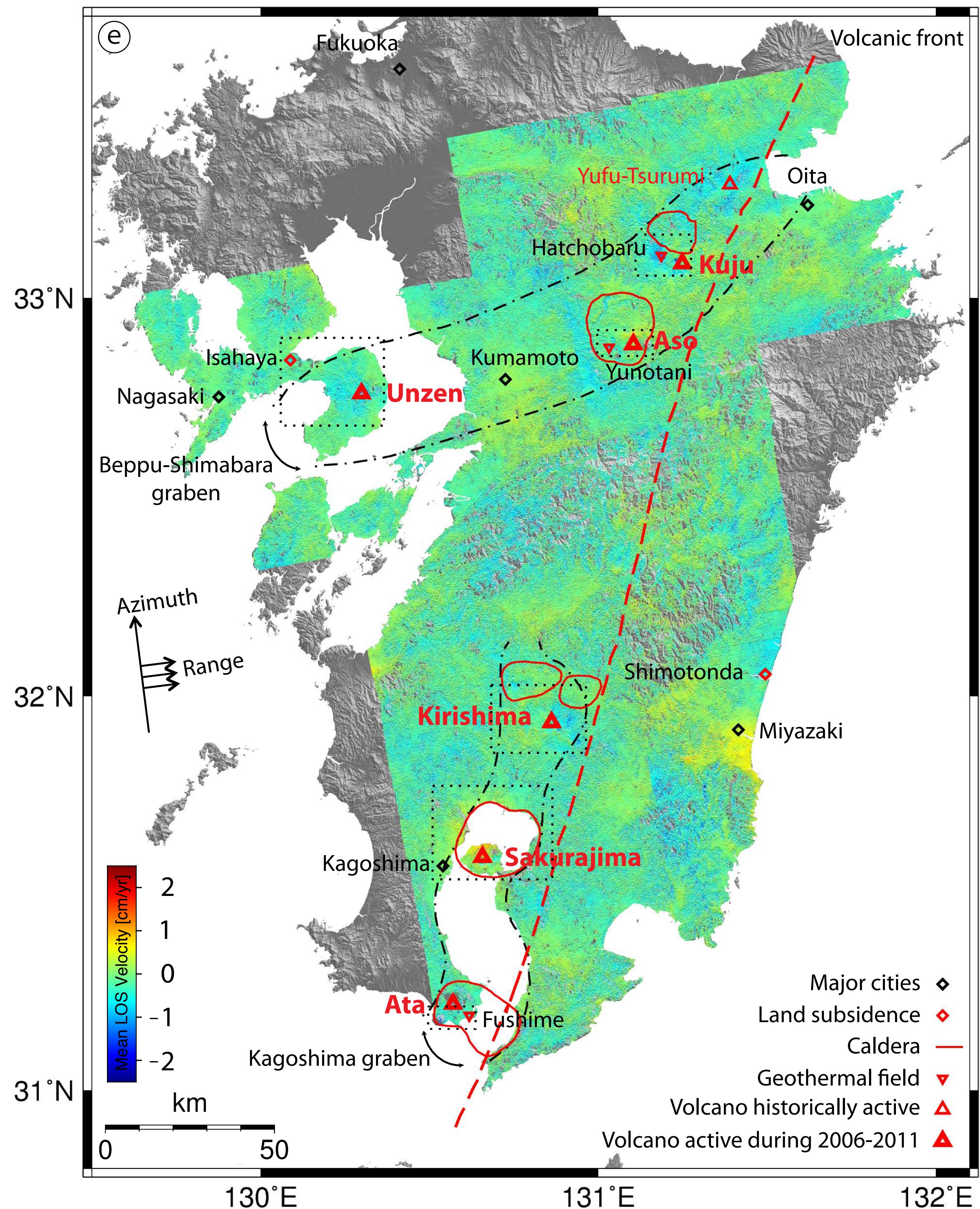
Data: JERS (1992-1998), ALOS (2006-2011)

Signals found:

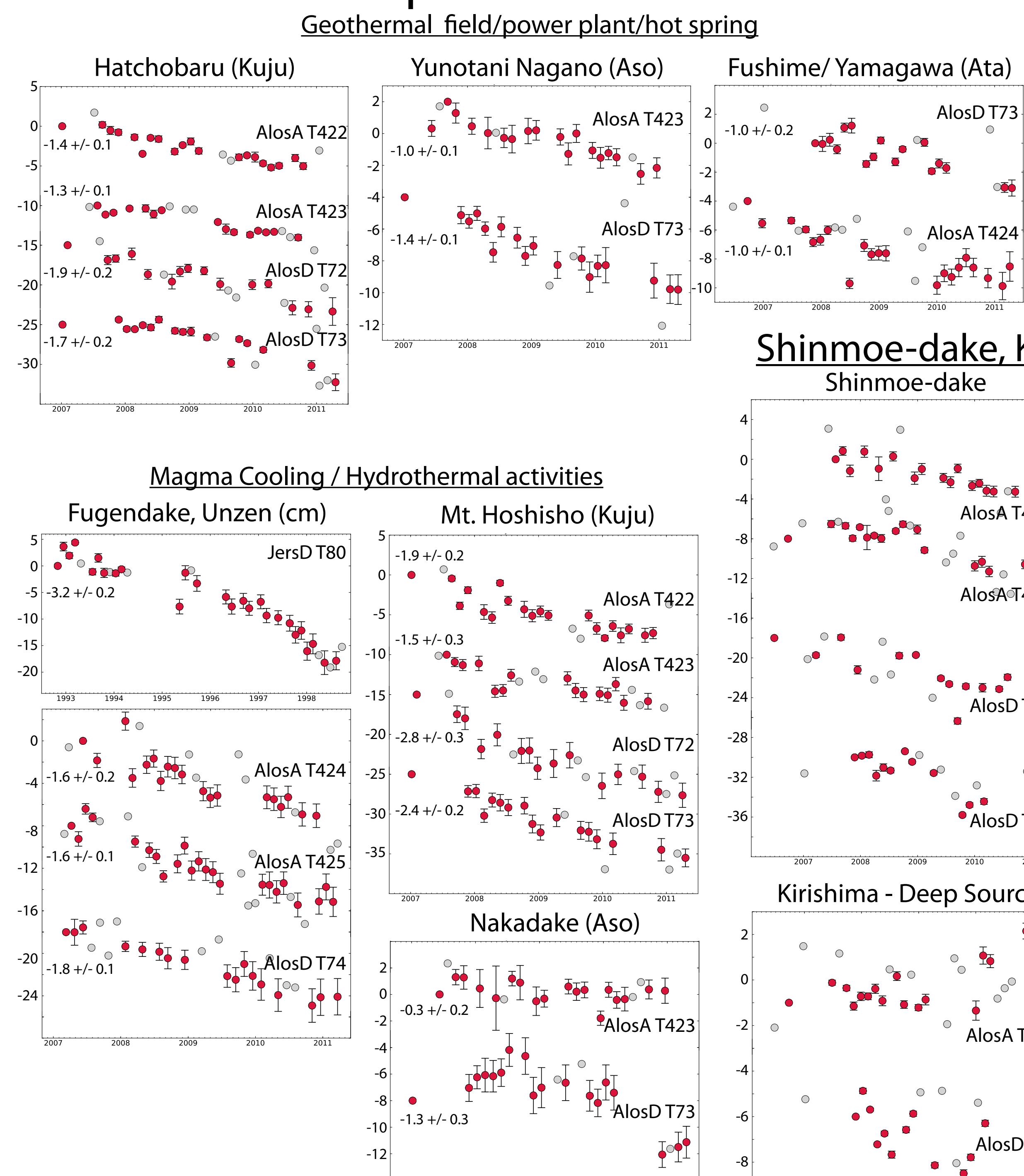
- Cooling Magma / Hydrothermal activities:
 - 1. Mt. Hoshisho, Kuju
 - 2. Nakadake, Aso since early 2011
 - 3. Fugendake, Unzen
 - 4. Shimoedake, Kirishima
 - 5. Kitadake, Sakurajima
- Subsidence at Geothermal field:
 - 1. Hatchobaru power plant
 - 2. Yunotani Nagano hot spring
 - 3. Fushime geothermal field / Yamagawa power plant
- Land Subsidence:
 - 1. Isahaya, Nagasaki
 - 2. Shimotonda, Miyazaki
- Volcanic Inflation:
 - 1. Aira caldera
 - 2. Sakurajima, North flank
 - 3. pre-eruptive inflation, Kirishima



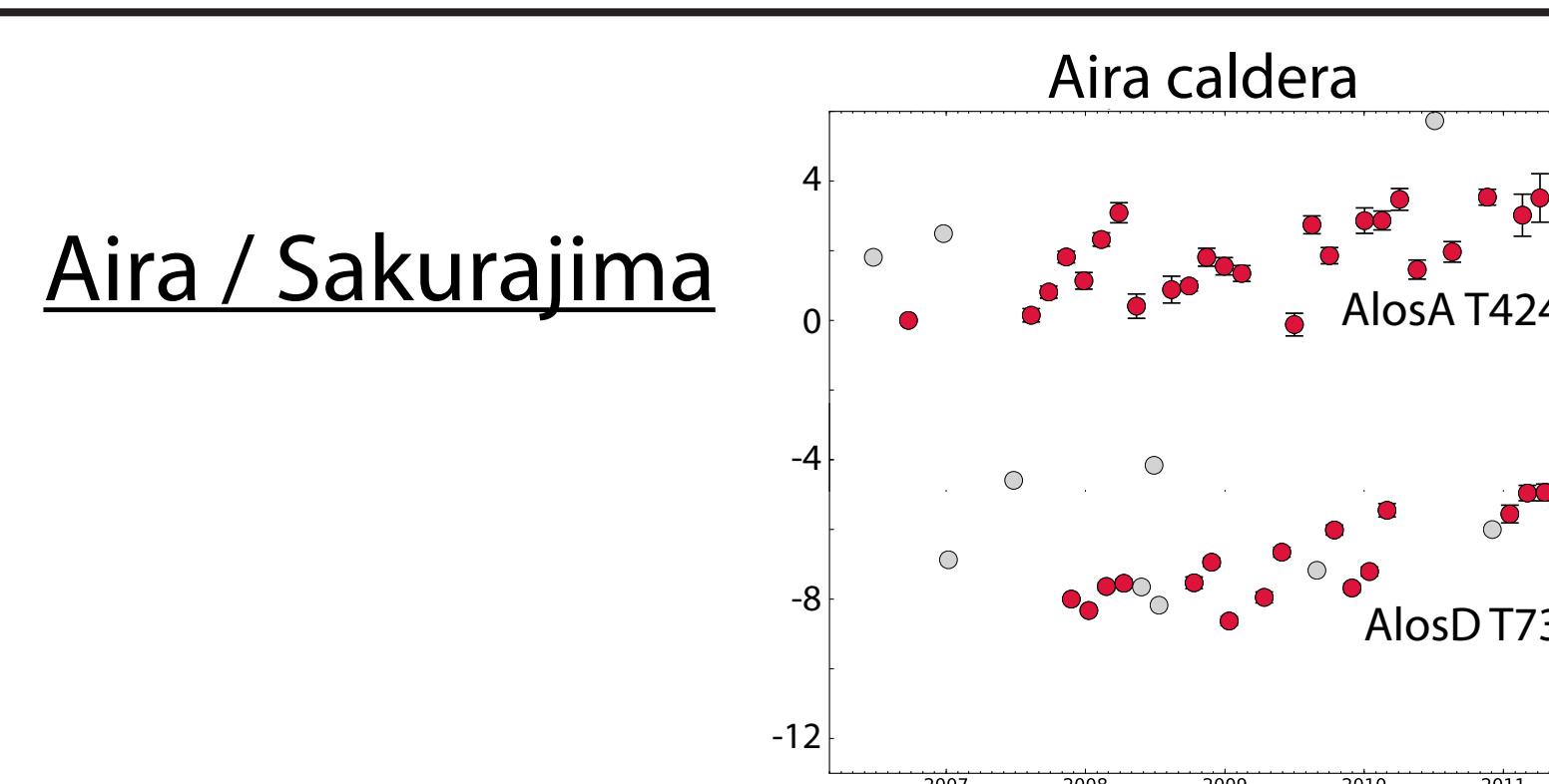
2 - Mean LOS Velocity



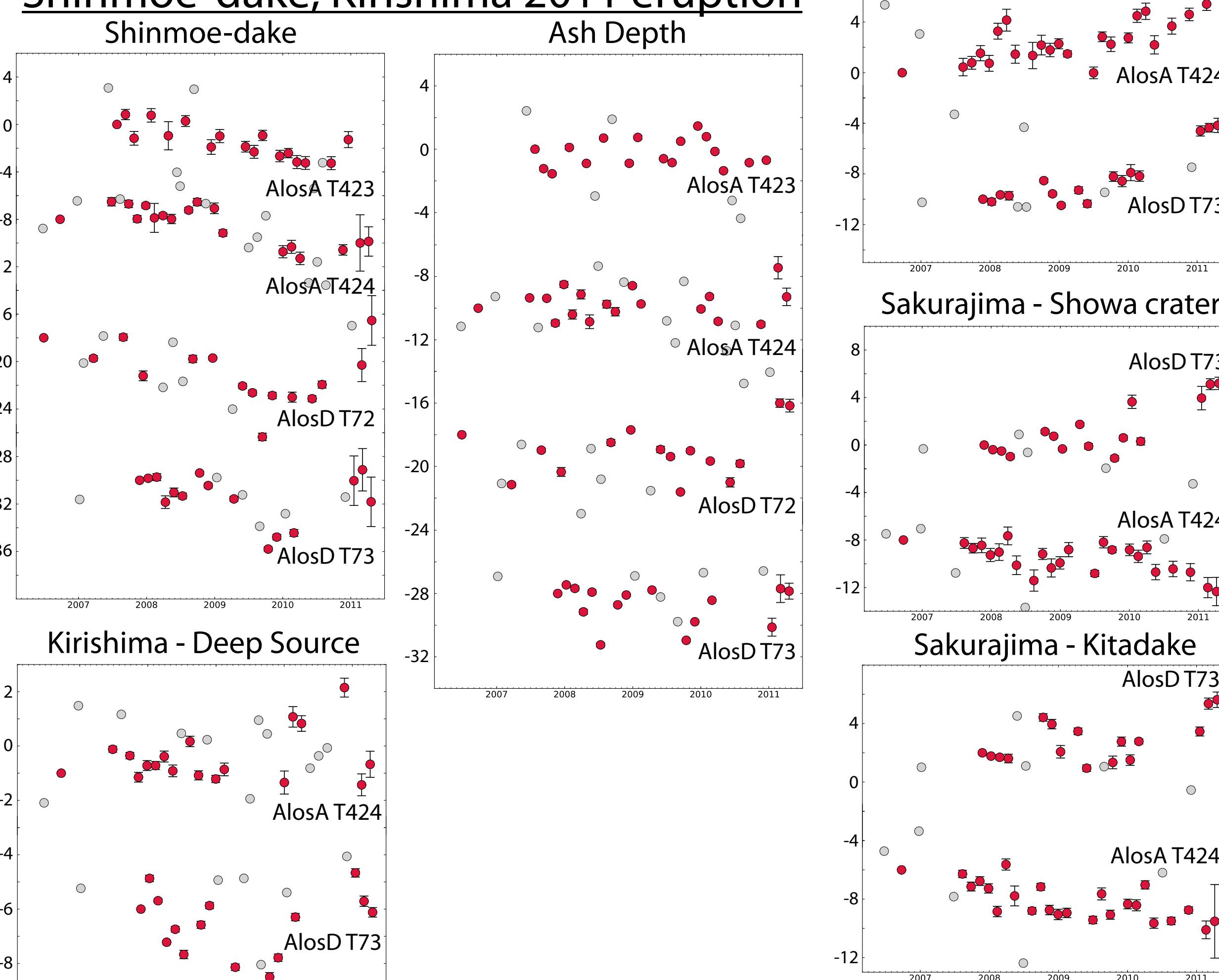
3 - Time Series Displacement



Aira / Sakurajima



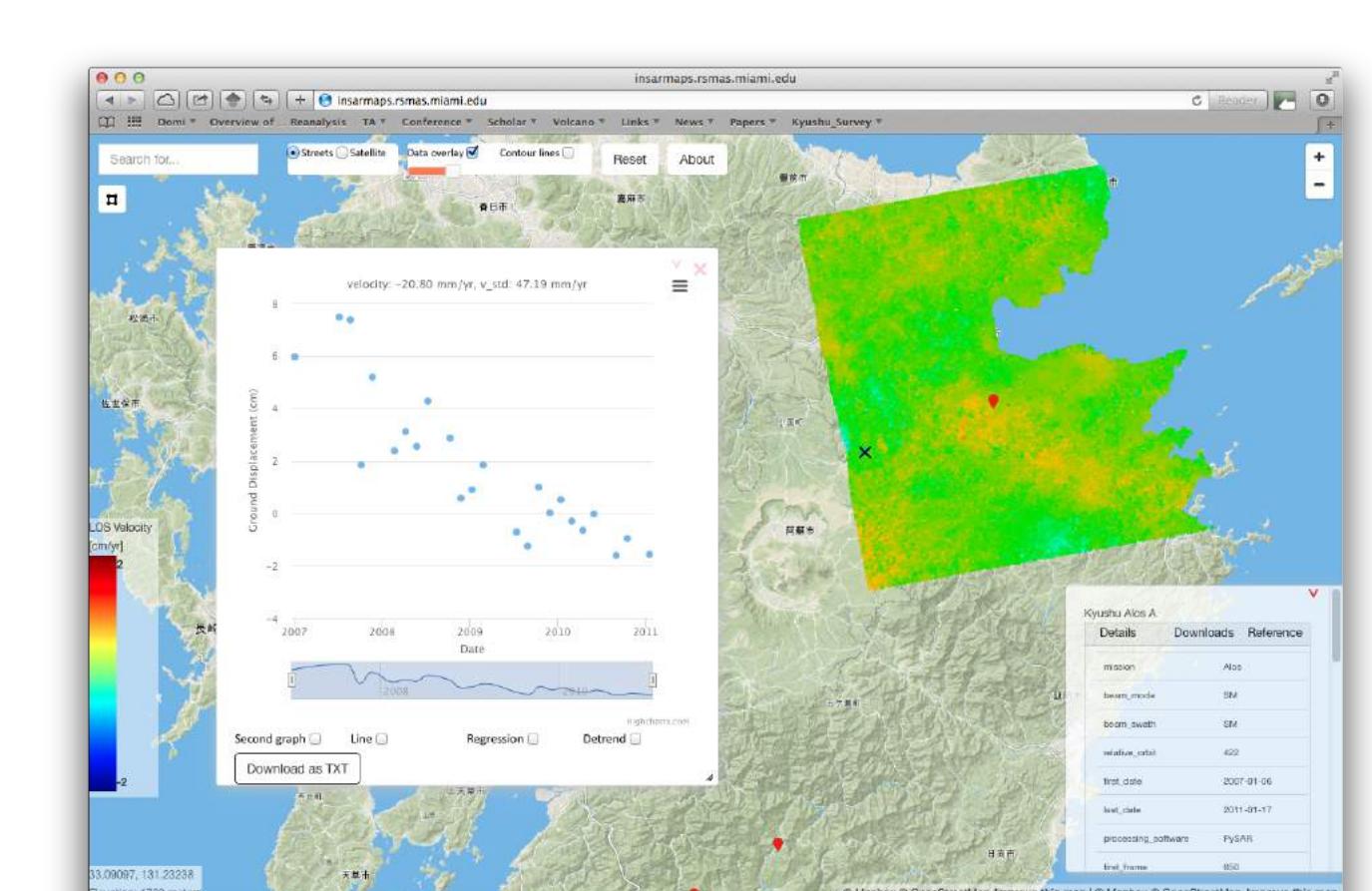
Shinmoe-dake, Kirishima 2011 eruption



4 - Web Viewer

All the data on this poster is available through a web viewer of time series InSAR data developed at University of Miami through the link below:

<http://insarmaps.rsmas.miami.edu>



All InSAR time series analysis use PySAR developed at University of Miami. PySAR is open source package and available through Github: <https://github.com/yunjunz/PySAR>

Reference

- Yunjun Z., Amelung F., Aoki Y. (2017), A time series InSAR survey of volcanic and anthropogenic deformation in Kyushu, SW Japan, (in prep).
- Biggs, J., S. Ebmeier, W. Aspinall, Z. Lu, M. Pritchard, R. Sparks, and T. Mather (2014), Global link between deformation and volcanic eruption quantified by satellite imagery, *Nature communications*, 5.

