SnT 2019
CTBT: SCIENCE AND TECHNOLOGY CONFERENCE

The Potential use of Interferometric Techniques in the Location and Size Estimation of Suspected Test Sites

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Background

- Pabian, F. & Coblentz, D. (2018). Observed surface disturbances associated with the DPRK's 3 September 2017 underground nuclear test. Seismological Research Letters, 89(6), 2017-2024.

- Wang, T., Shi, Q., Nikkhoo, M., Wei, S., Barbot, S., Dreger, D., ... & Chen, Q. F. (2018). The rise, collapse, and compaction of Mt. Mantap from the 3 September 2017 North Korean nuclear test. *Science*, *361*(6398), 166-170

Both papers map the ground deformation after the 3 September 2017 nuclear explosion in Mt. Mantap test site in the DPRK using high-resolution imagery (Terra Sar X satellites)

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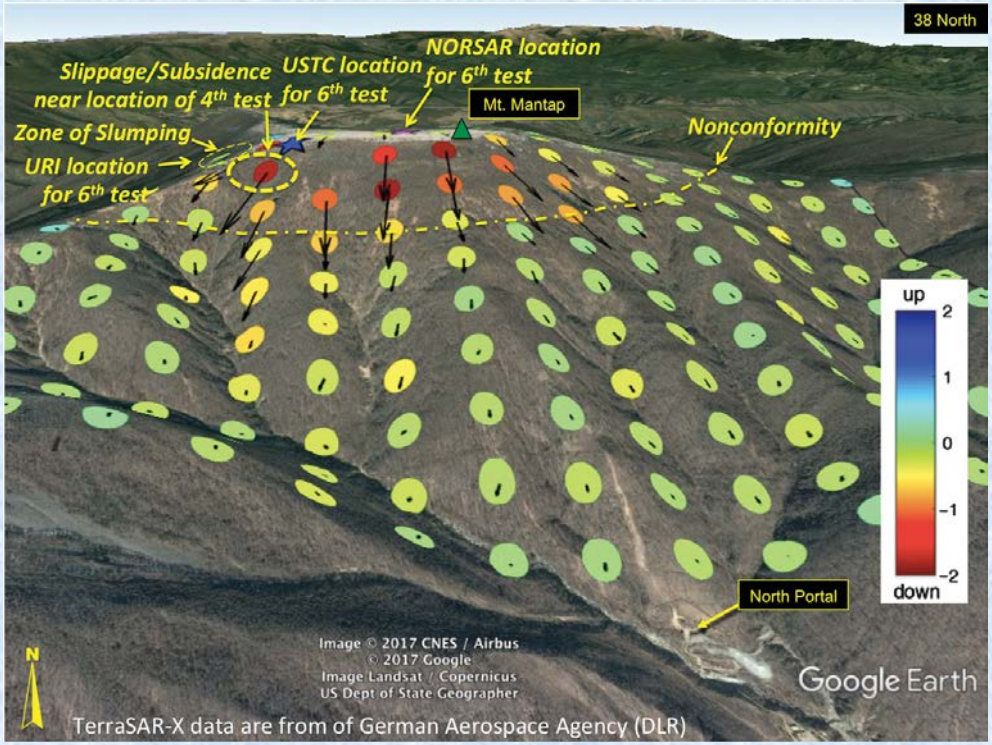

Pabian & Coblentz:

InSAR results from high-Resolution Terra-SAR X Imagery

Purpose of this Presentation

- Can we use open source radar images to map the deformation of Mount Mantap test site in the DPRK from the Sentinel-1 mission that have a lower resolution? ADVANTAGE: Open Source

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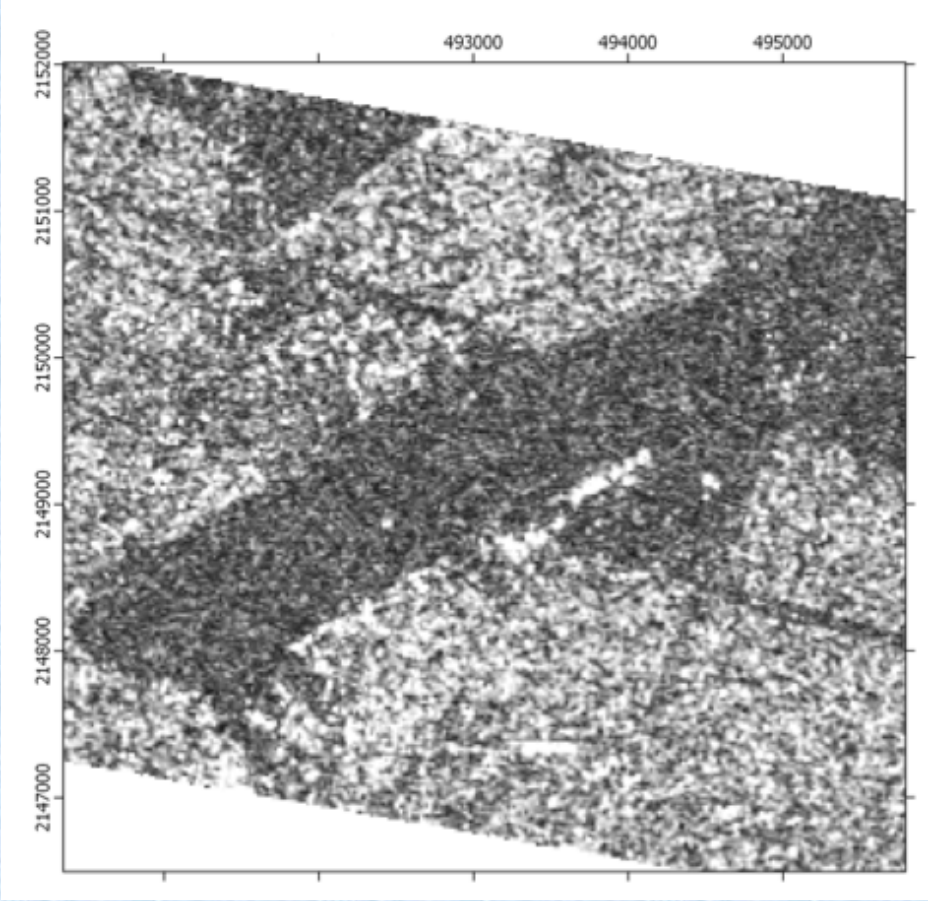
- Can we use open source radar images to map the deformation of Mount Mantap test site in the DPRK from the Sentinel-1 mission that have a lower resolution? ADVANTAGE: Open Source
- How will these results compare with those obtained with higher resolution images from the Terra SAR X satellites?
- Could InSAR and other interferometric techniques using open source data and processing modules be of use for future OSI?

Difference Between High-Resolution Terra SAR X Imagery and Sentinel 1: Mexico City Airport



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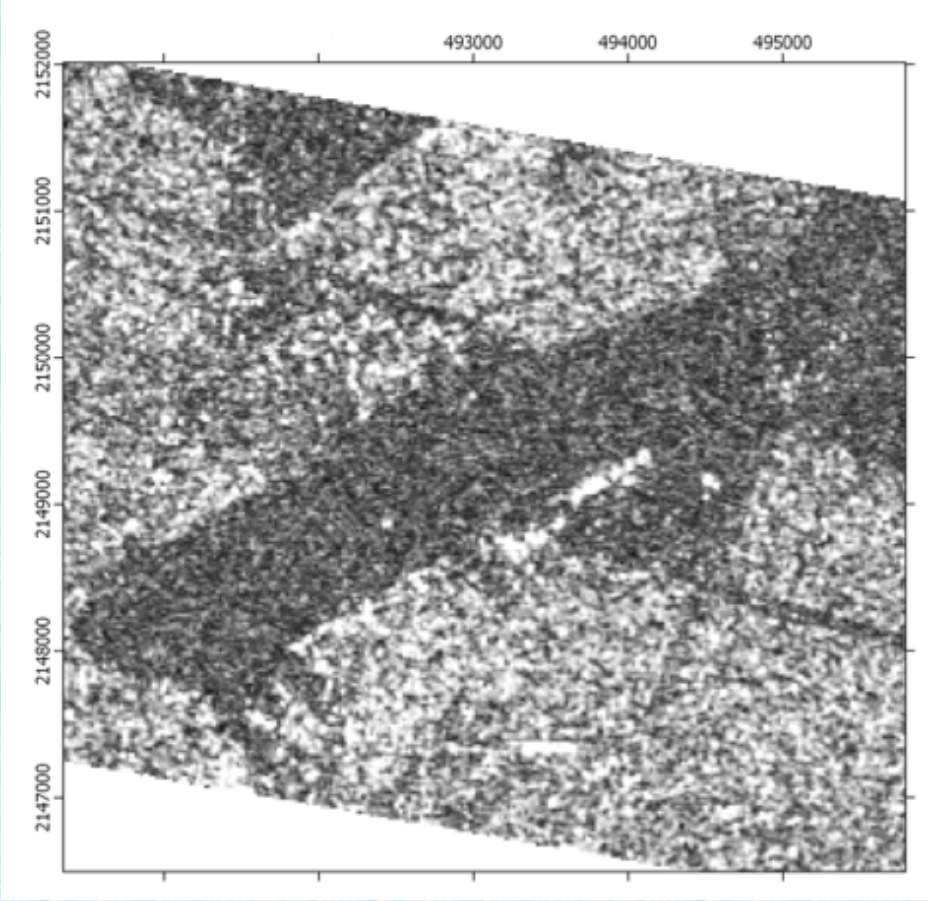

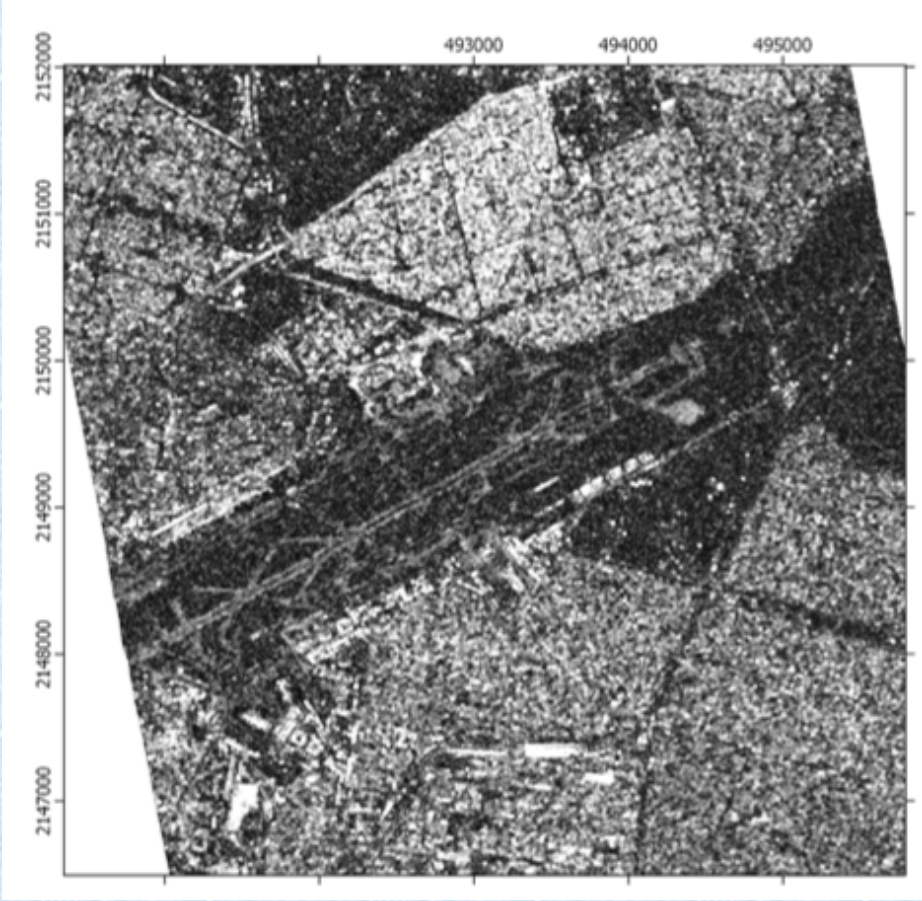

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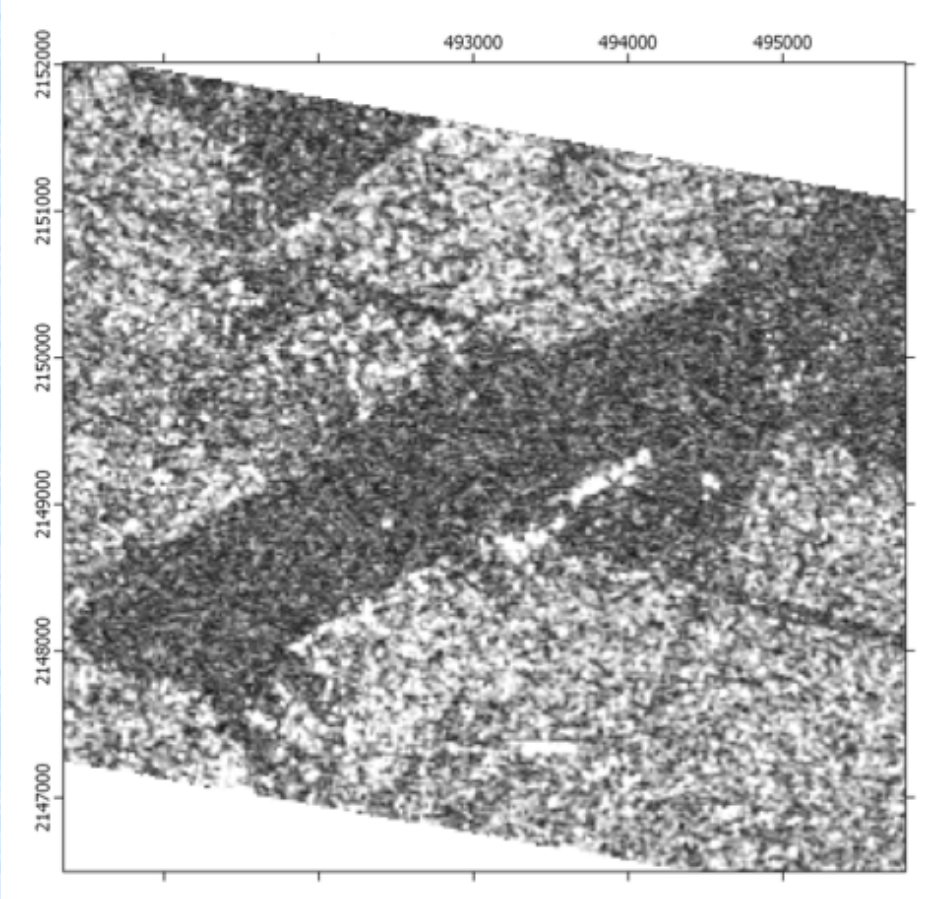
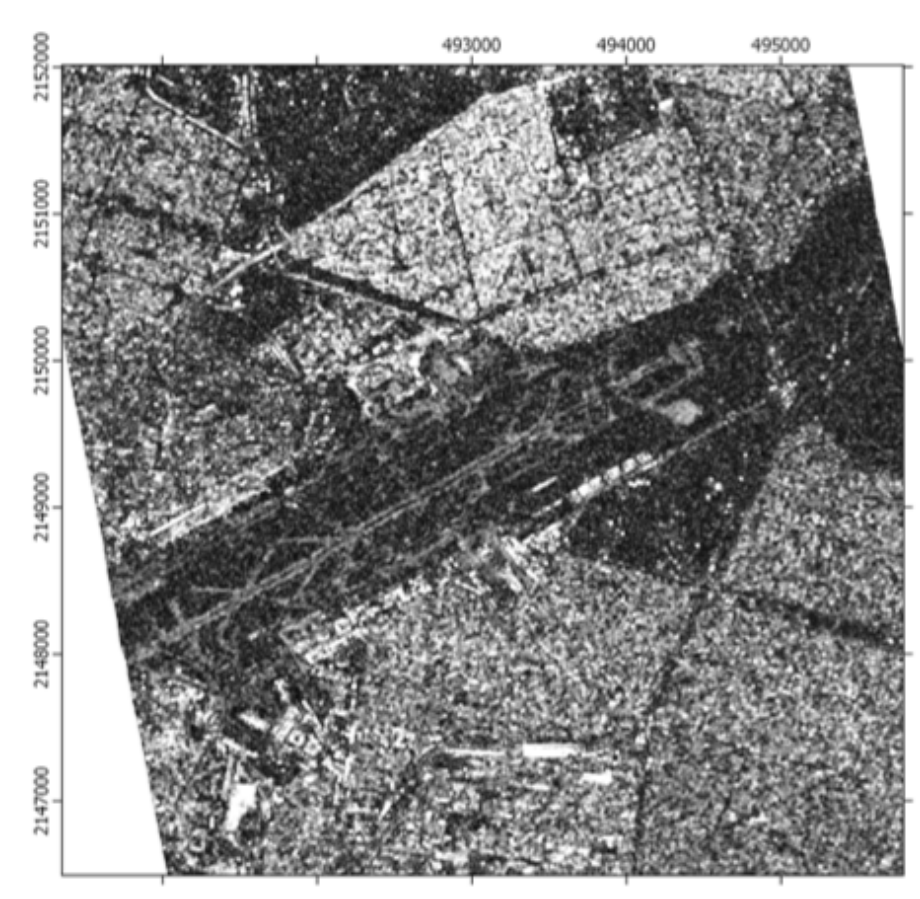
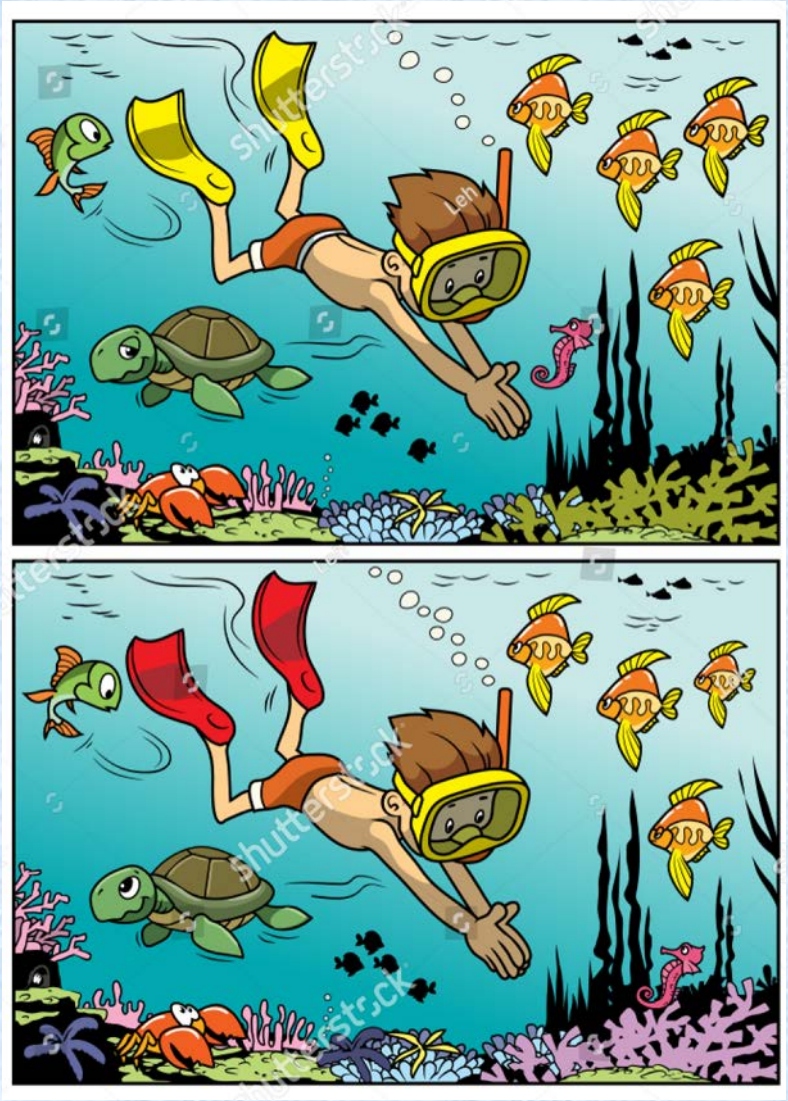




Sentinel-1 Mission:
C-Band: 5.56 cm wavelength
Resolution: 13 m

Terra SAR X
X-Band: 3 cm wavelength
Resolution: 3 m

What is Interferometry? Find the difference between two images



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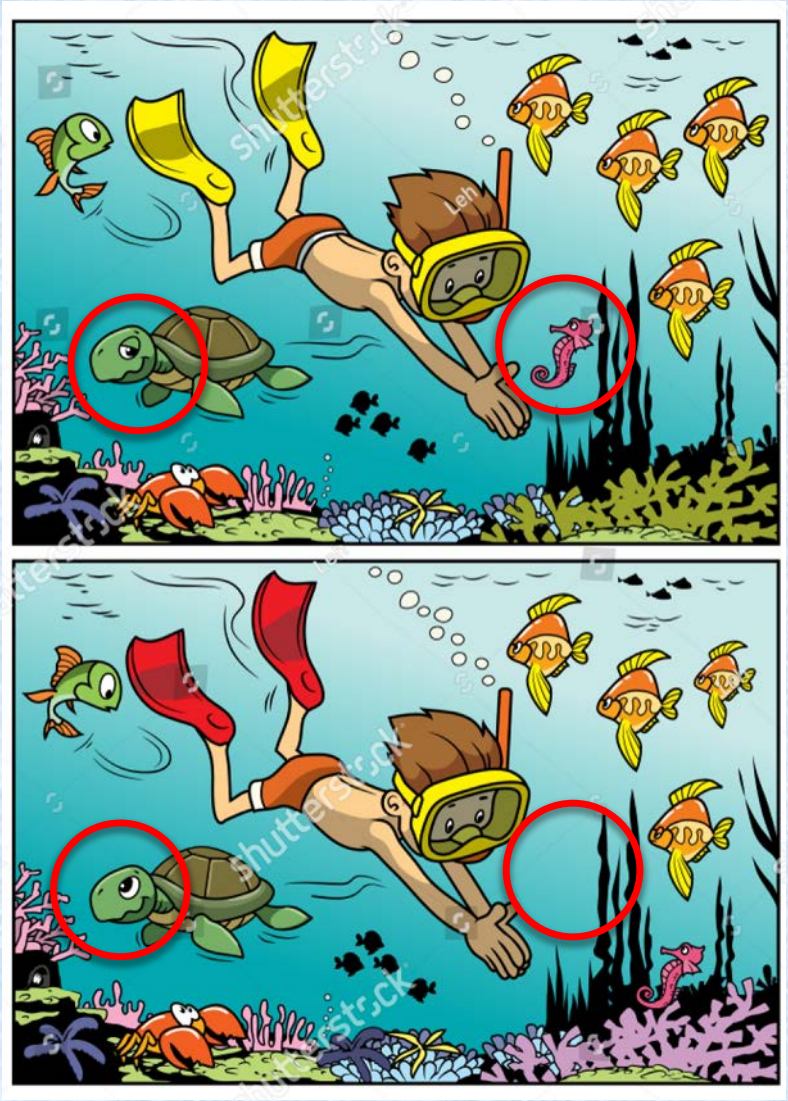
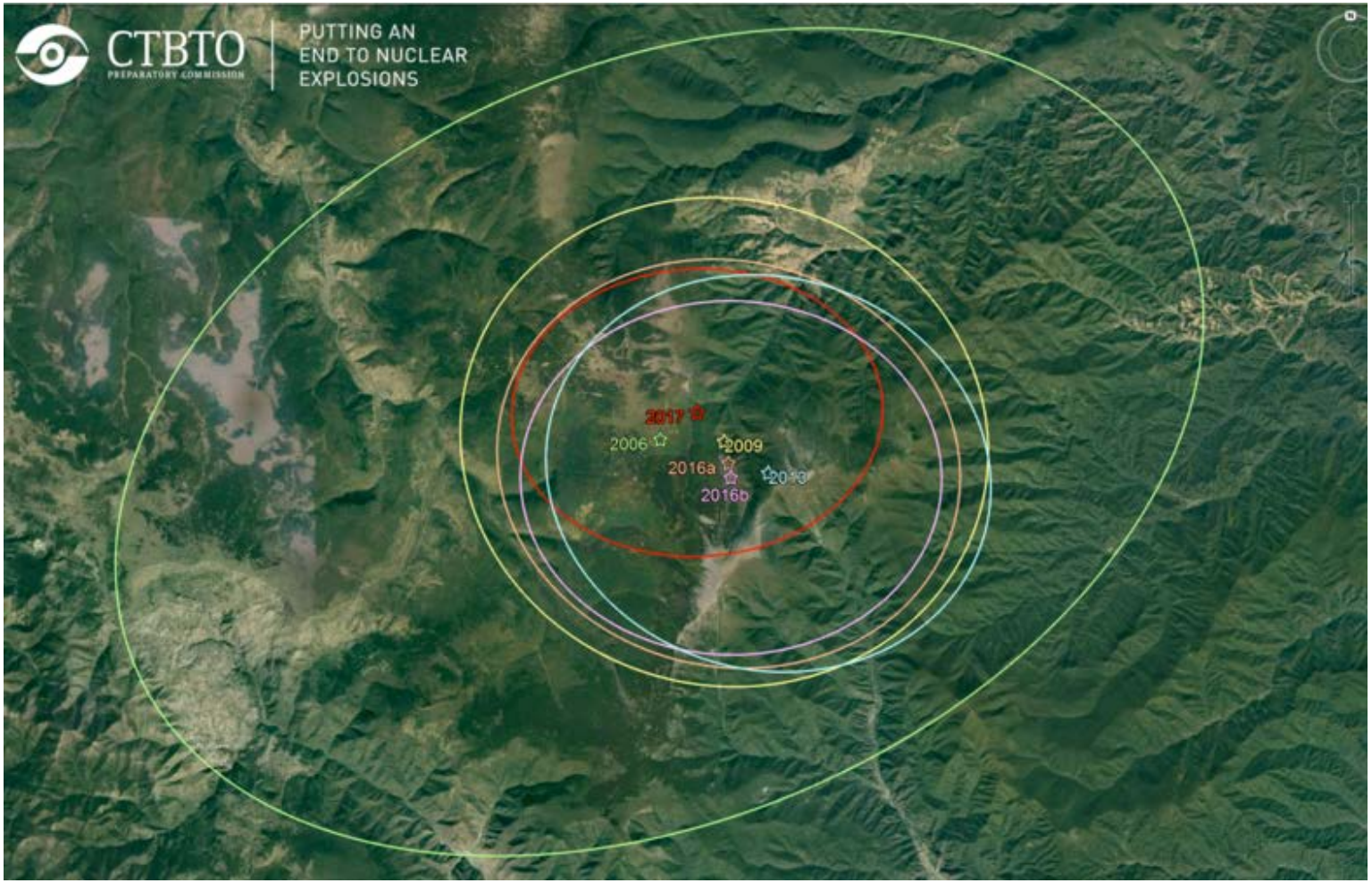


ISC Location of DPRK Nuclear Tests



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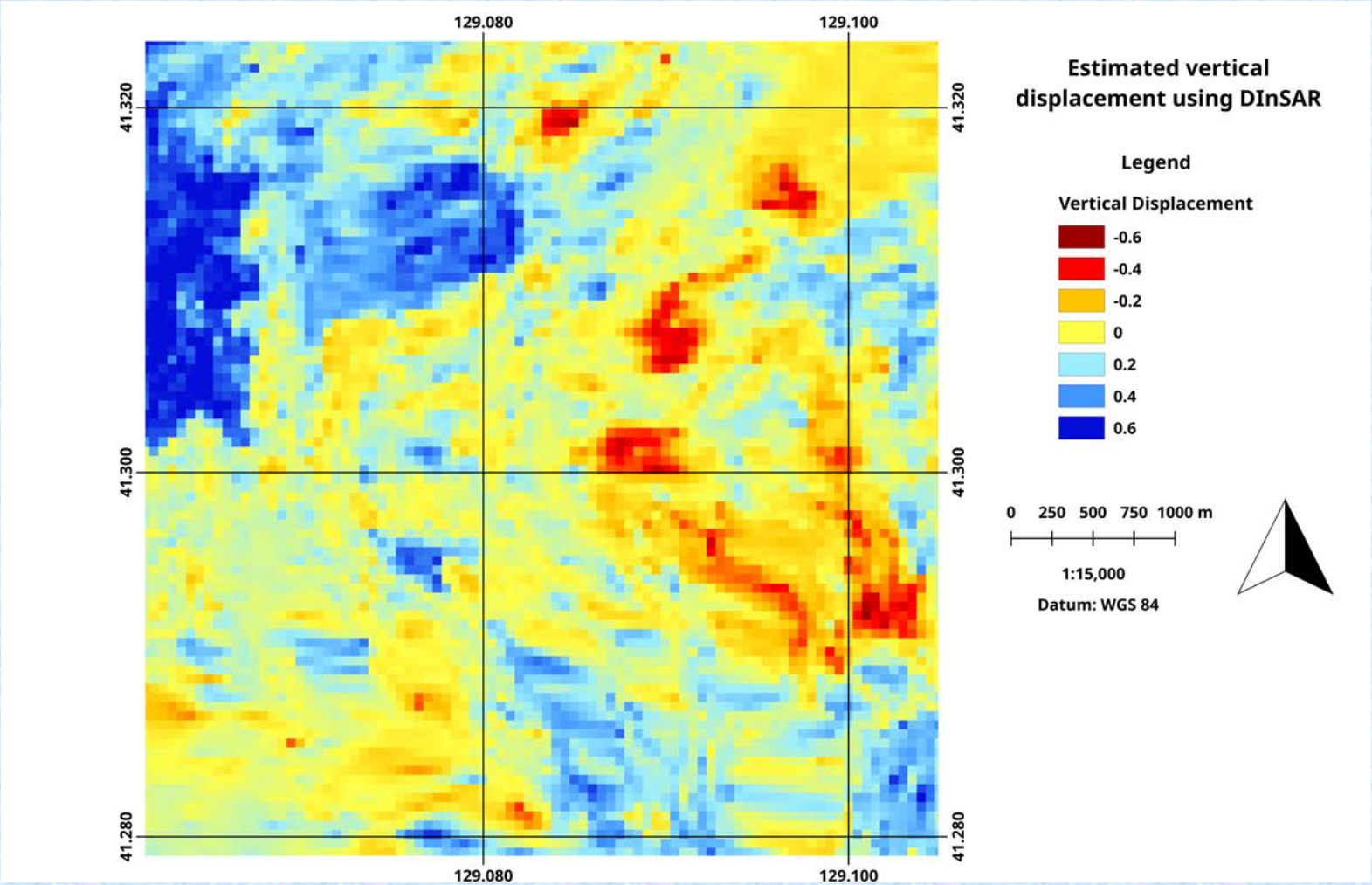

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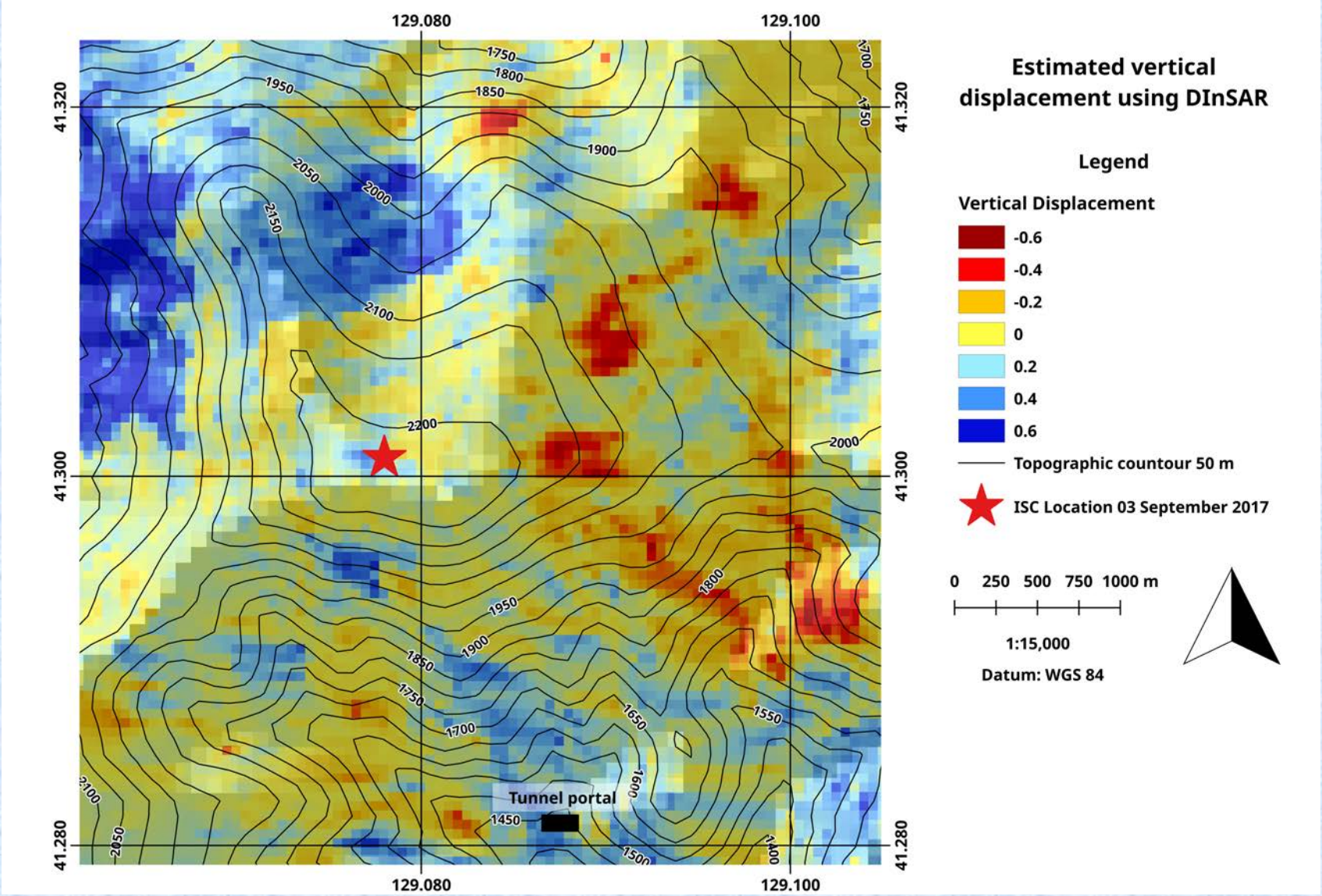
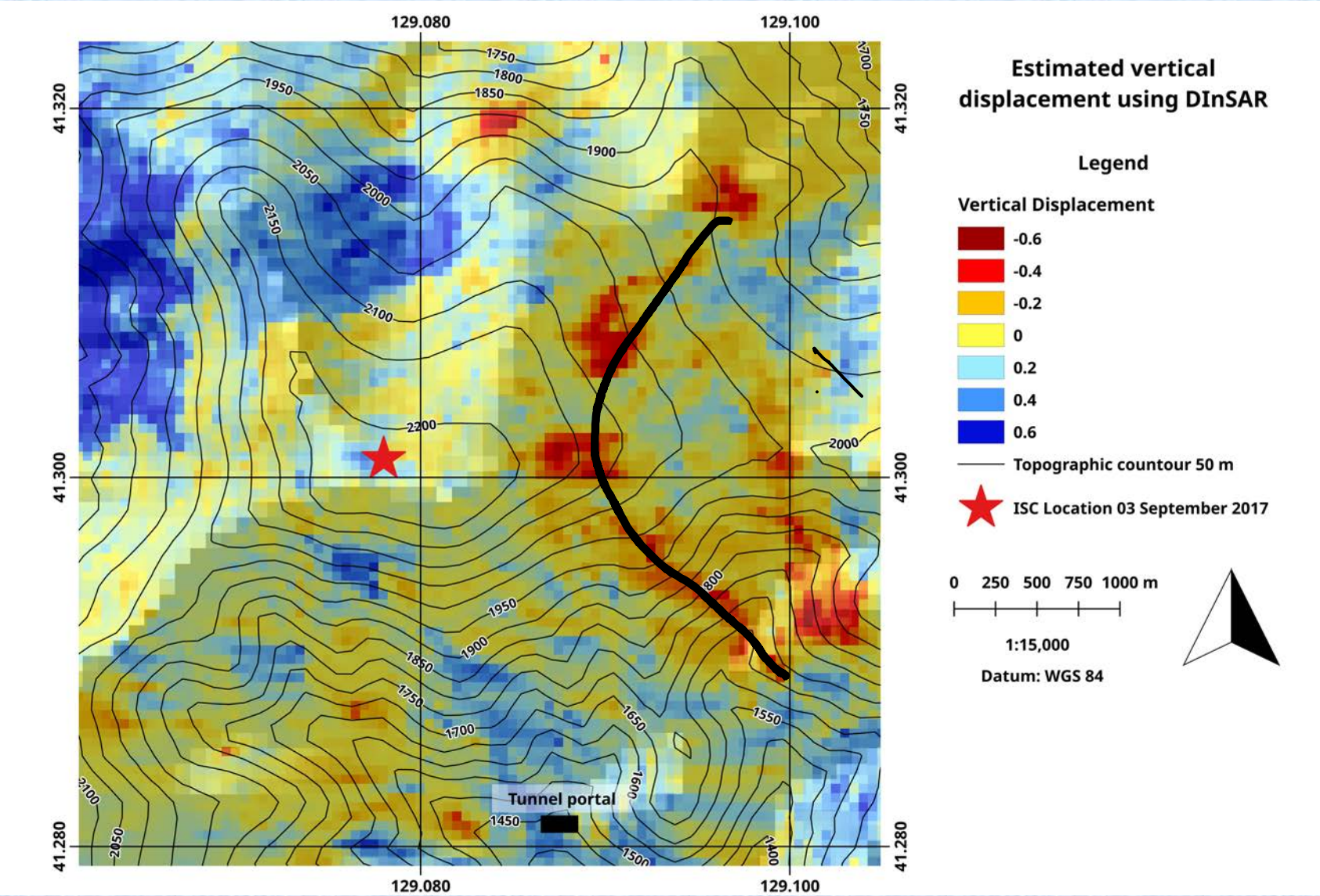
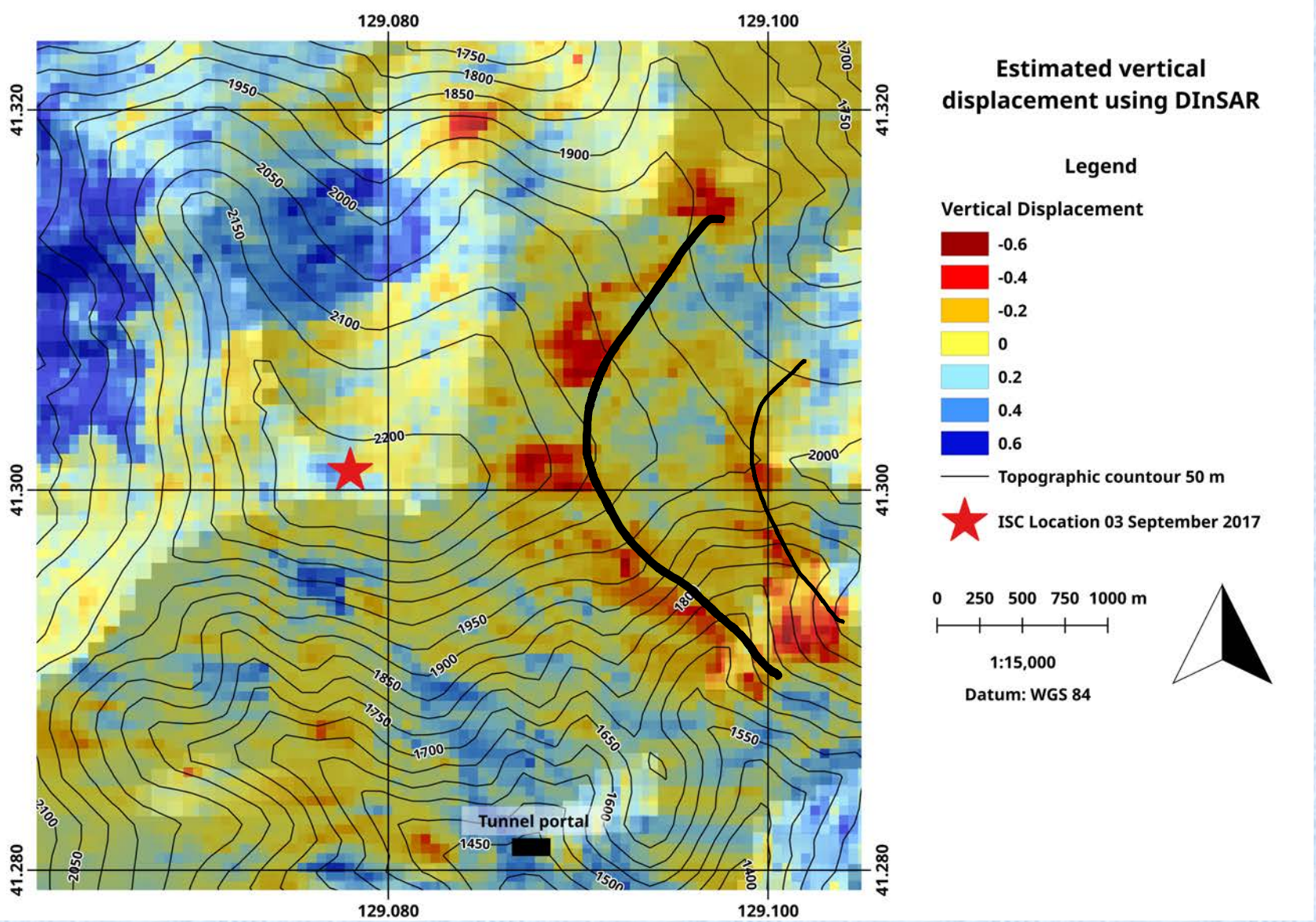


Large Scale Slumping of Mt. Mantap Test Site



Secondary Fauling of the Mountain



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- Mt. Mantap appears to have been highly fractured by the 3 September 2017 nuclear test.

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SPECULATION!

PERHAPS MT. MANTAP TEST SITE HAS BEEN HIGHLY FRACTURED AND FAULTED AND IS NOW UNUSABLE (OR DANGEROUS) FOR LARGE TESTS (Y > 100 kT?)

- Mt. Mantap appears to have been highly fractured by the 3 September 2017 nuclear test.

1997 F1 Champion: Williams-Renault vs the 2019 Mercedes AMG

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BEST QUALYFING LAPS

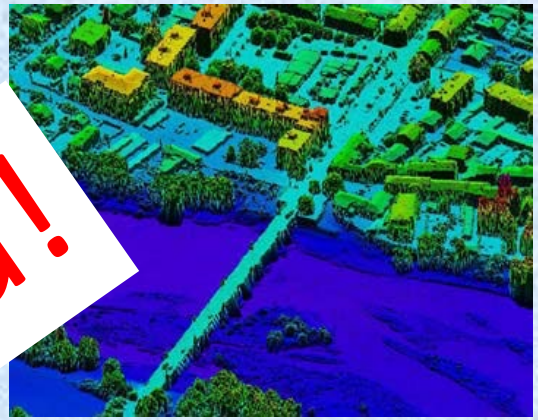
1997 1´ 18.94´´

2019 1´ 11.04´´

Technology Refreshment

vs

Technology Foresight



Thank you!