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SpaCeborne SAR Interferometry as a Noninvasive tool to assess the vulnerability over Cultural hEritage sites

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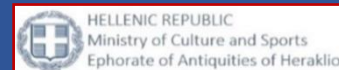
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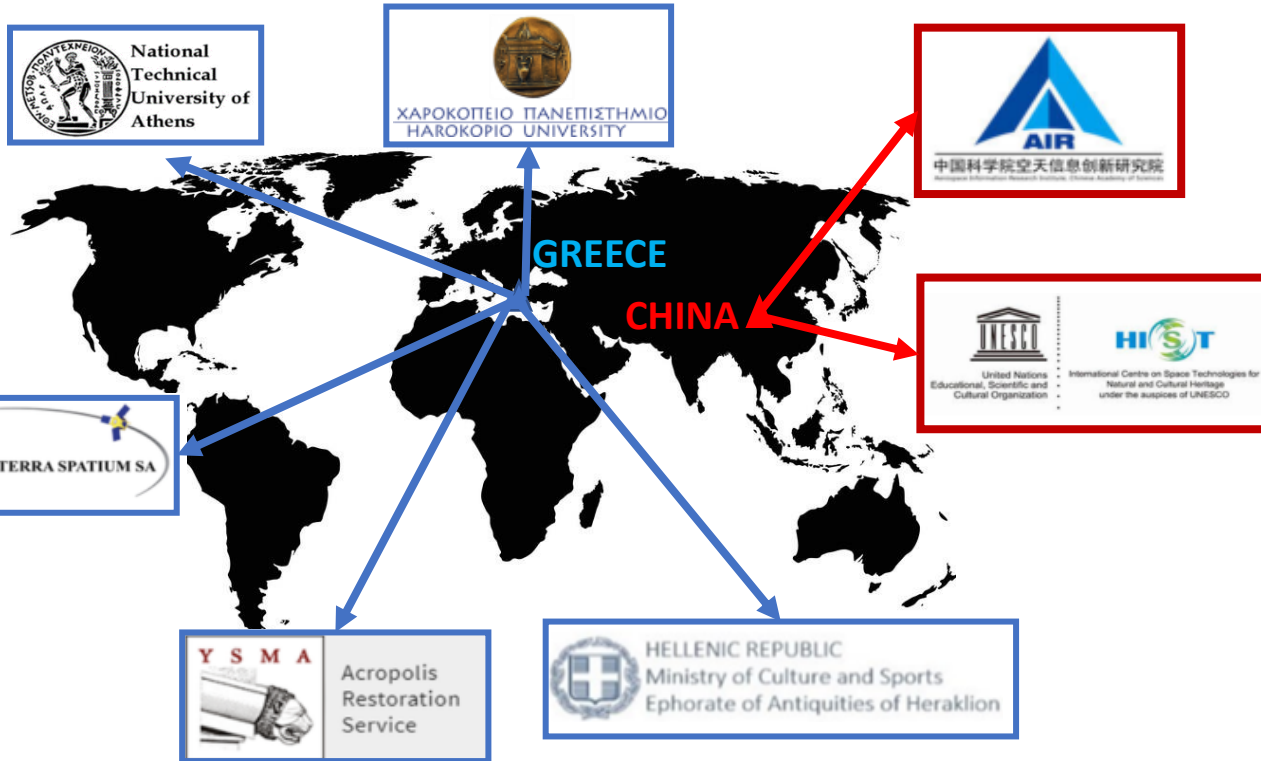
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GREECE



The Acropolis of Athens
"In UNESCO's World Heritage Sites List since 1987"



The Heraklion City Walls
"Among the best-preserved Venetian fortifications in Europe"

CHINA



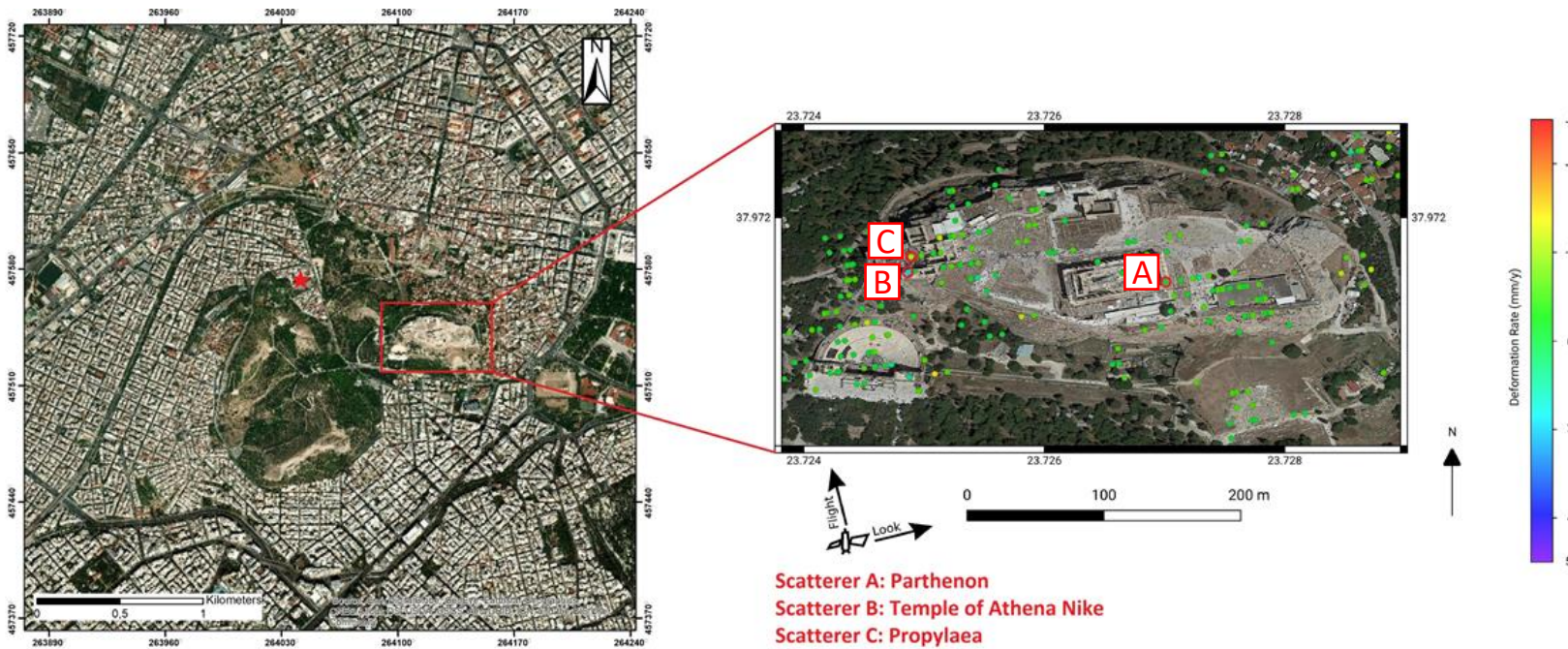
The Great Wall in Zhangjiakou
"Constructed in the period of the Ming Dynasty (1403-1487 A.D.)"



The Ming Dynasty City Walls in Nanjing
"Is considered as the longest surviving city walls in China"

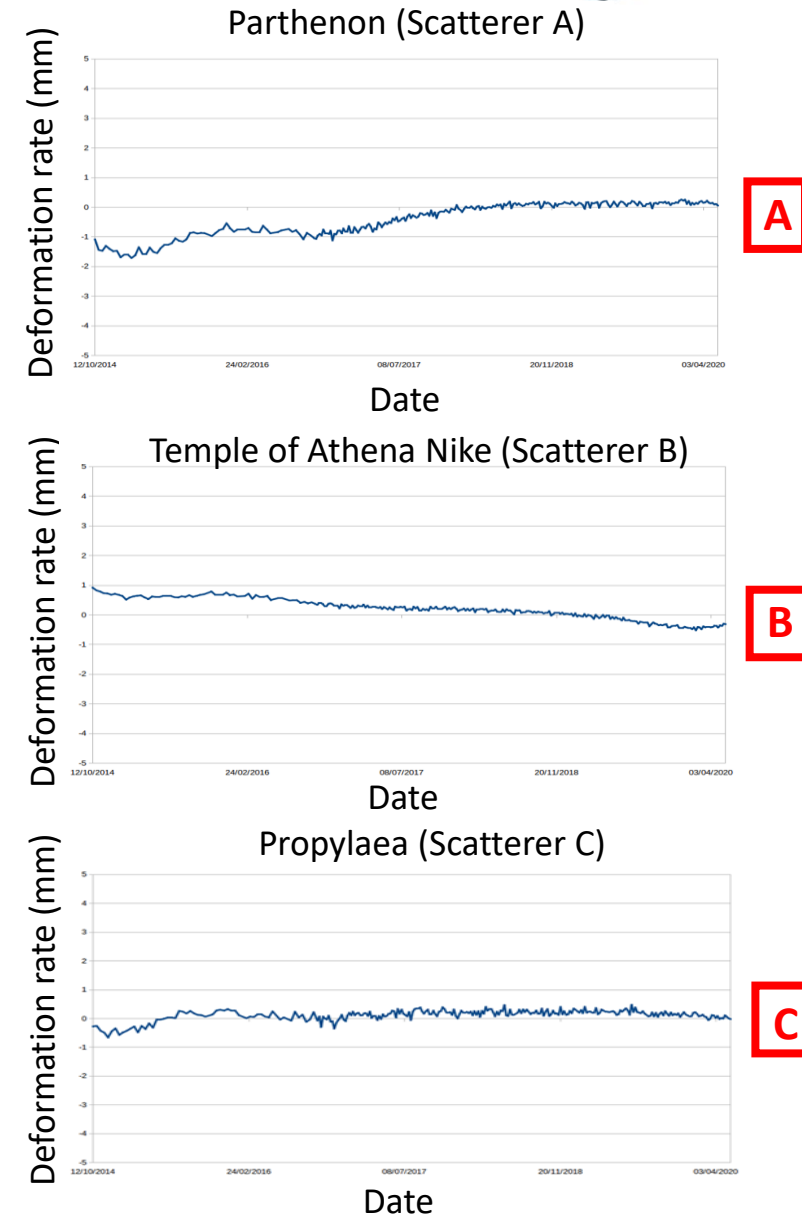


Acropolis Case Study – Persistent Scatterers Interferometry (PSI)



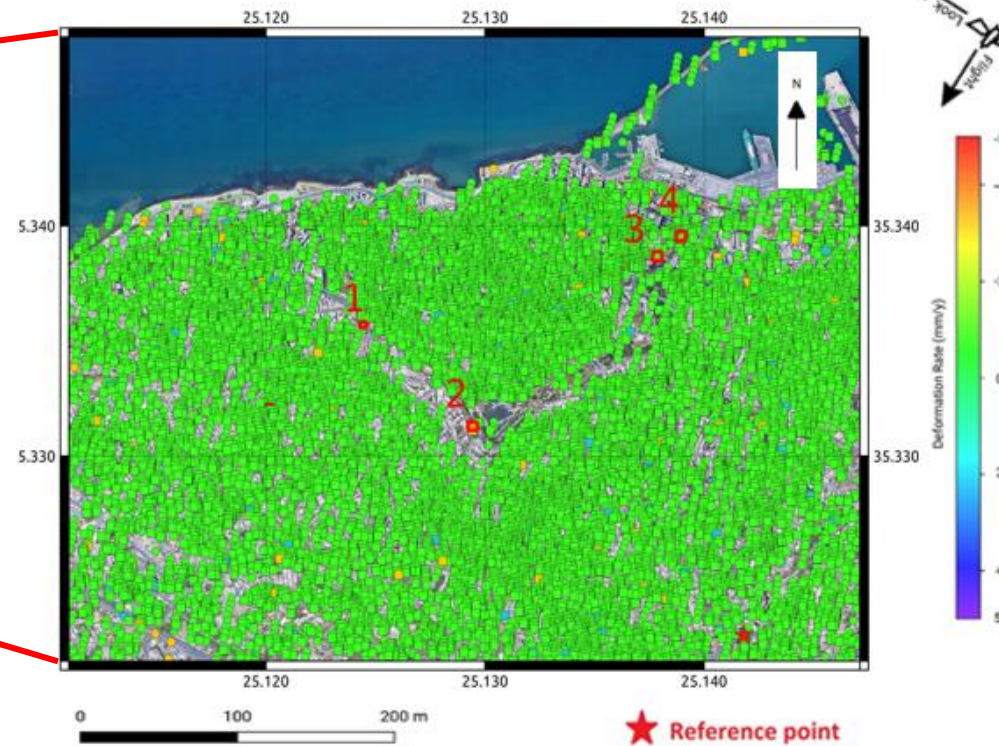
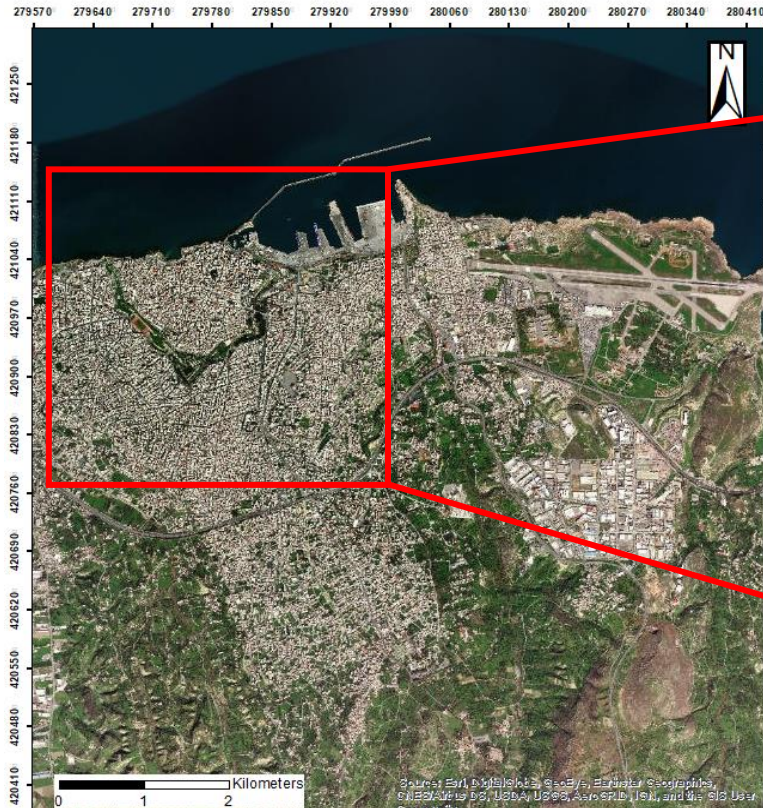
★ Reference point

Location: The Acropolis Complex is located in the center of the city of Athens, Greece.
Geological background: lies upon two lithostratigraphic units of the Athens schist (upper Cretaceous) and the overlying Acropolis limestone (upper Jurassic).
Data: 274 Sentinel-1 SLC images (Ascending acquisition geometry).
Description of multitemporal deformation timeseries from October 2014-May 2020:
A) moves **towards** the Line-Of-Site (LOS)
B) moves **away** from the LOS
C) shows **stability** compared to Scatterer A and B





Heraklion City Walls Case Study – Persistent Scatterers & Distributed Scatterers Interferometry (PS/DS)



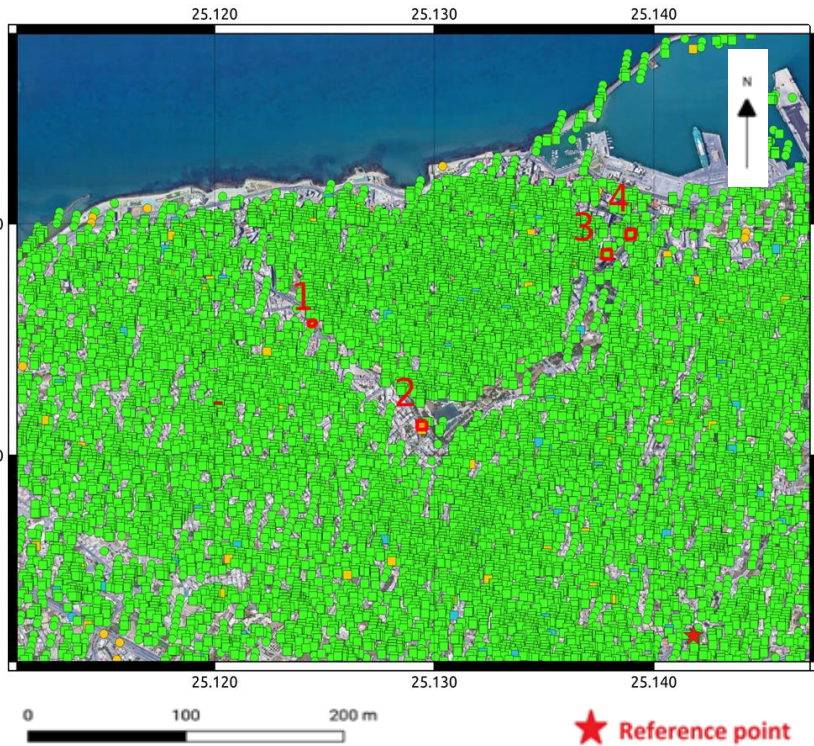
Location: The Heraklion City Walls is located in the center of the city of Heraklion of Crete, Greece.

Geological background: lies upon pre-Neogene rocks form the alpine basement over which the basin's sediments have been deposited. Basement rocks comprise bodies of the upper nappes of Crete(Ophiolite, Pindos and Tripolitza nappes). Mesozoic to Eocene limestones occur in the margins of the basin and as isolated bodies within the basin. Eocene flysch sediments occur at its northeastern margins.

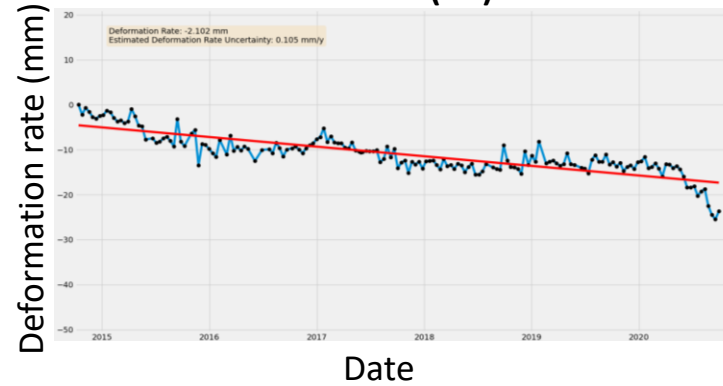
Data: 175 Sentinel-1 SLC images (Descending acquisition geometry).



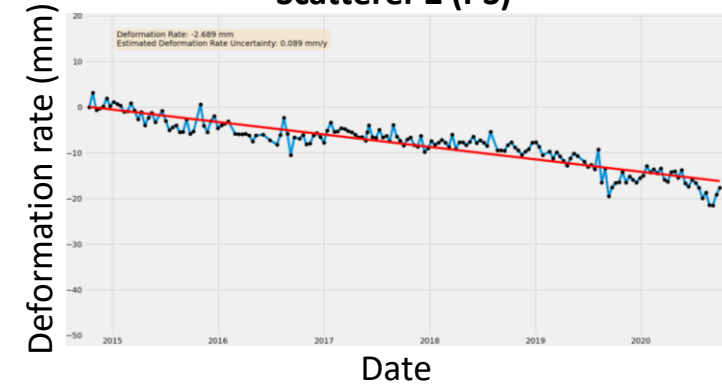
Heraklion City Walls Case Study – Persistent Scatterers & Distributed Scatterers Interferometry (PS/DS)



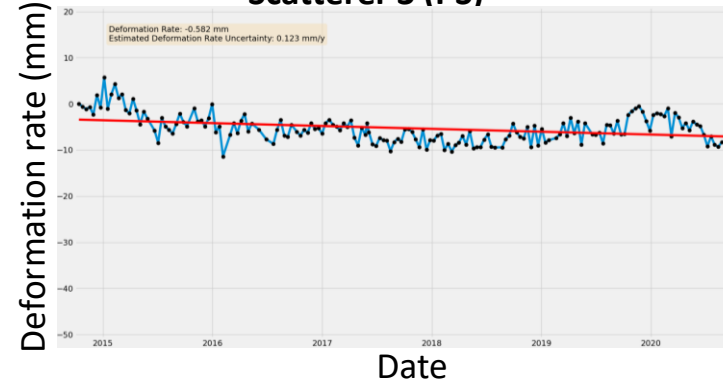
Scatterer 1 (DS)



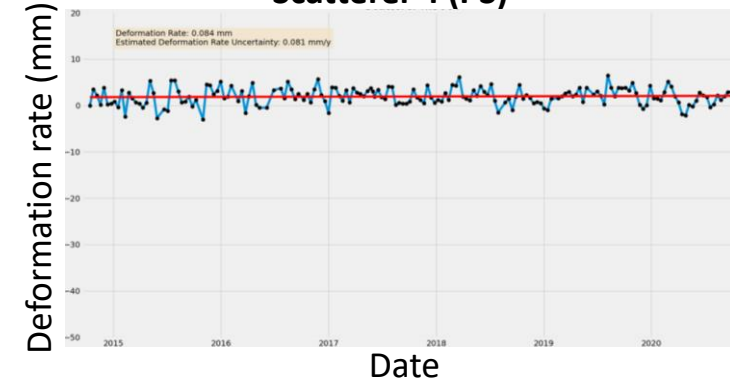
Scatterer 2 (PS)



Scatterer 3 (PS)



Scatterer 4 (PS)



Description of multitemporal deformation timeseries from October 2014-September 2020:

- 1) + 2) move **away** the Line-Of-Site (LOS)
- 3) + 4) show **stability** compared to Scatterers 1 and 2



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