



**SATELLITE
DATA**

EPOS TCS Satellite Data: Observations and Products for Geohazards Analyses

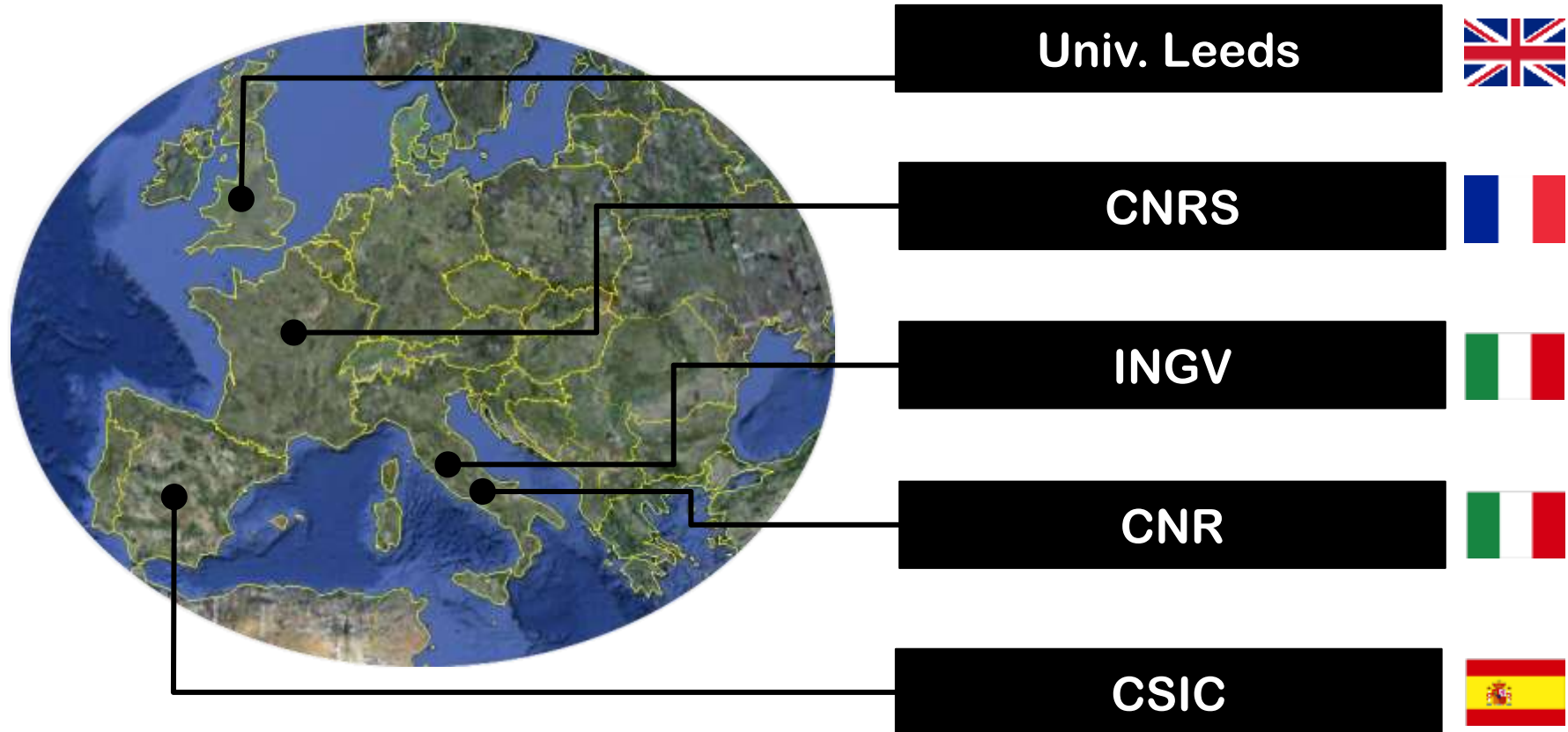
Michele Manunta

TCS Satellite Data Director

CNR-IREA – Italy – email: manunta.m@irea.cnr.it



TCS Satellite Data aims to foster the use and re-use of satellite data and products to establish multidisciplinary research in Earth sciences. TCS SATD widely benefits from the **Copernicus Programme** to deploy advanced satellite services with a **free and open data access** policy.

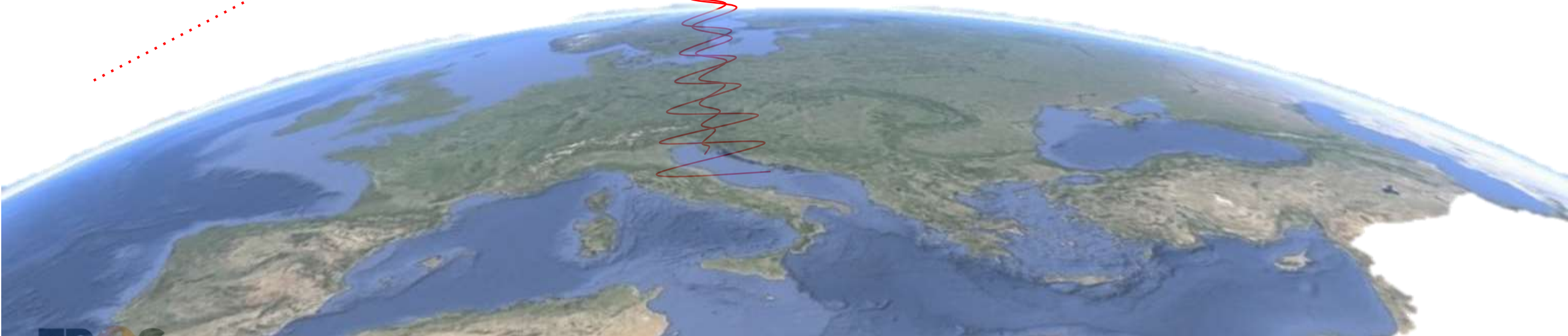
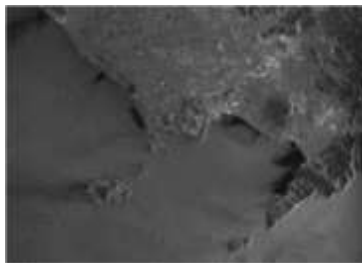


Ground Displacements Measured from the Space



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SAR scene @ **TO MASTER**

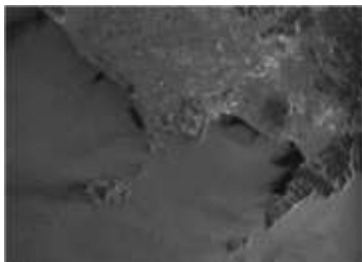


Ground Displacements Measured from the Space

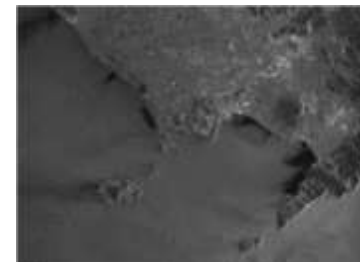


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SAR scene @ **TO MASTER**



SAR scene @ **T1 SLAVE**

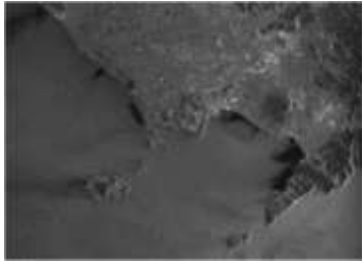


Ground Displacements Measured from the Space

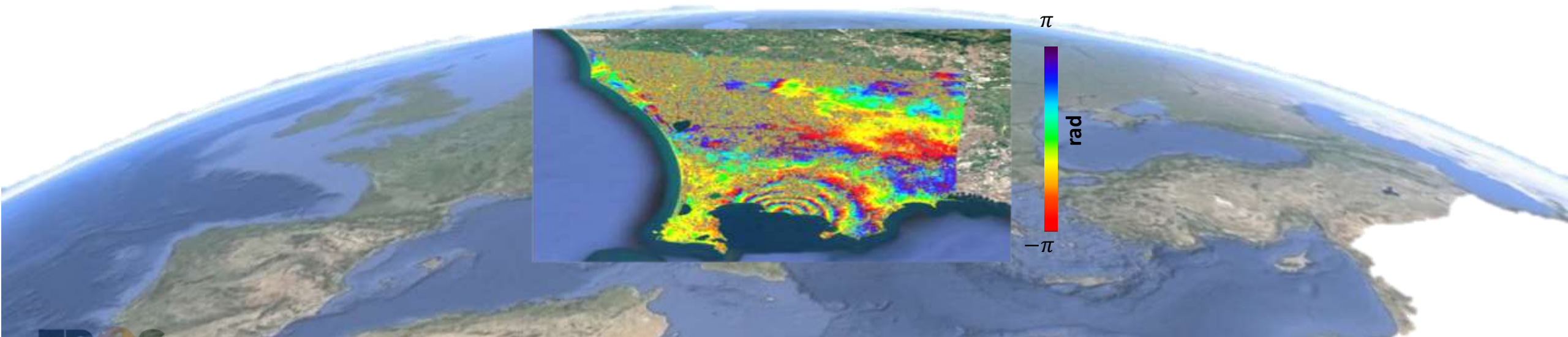
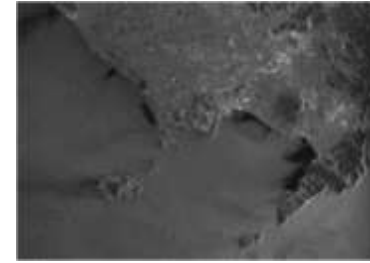


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SAR scene @ **T0 MASTER**



SAR scene @ **T1 SLAVE**



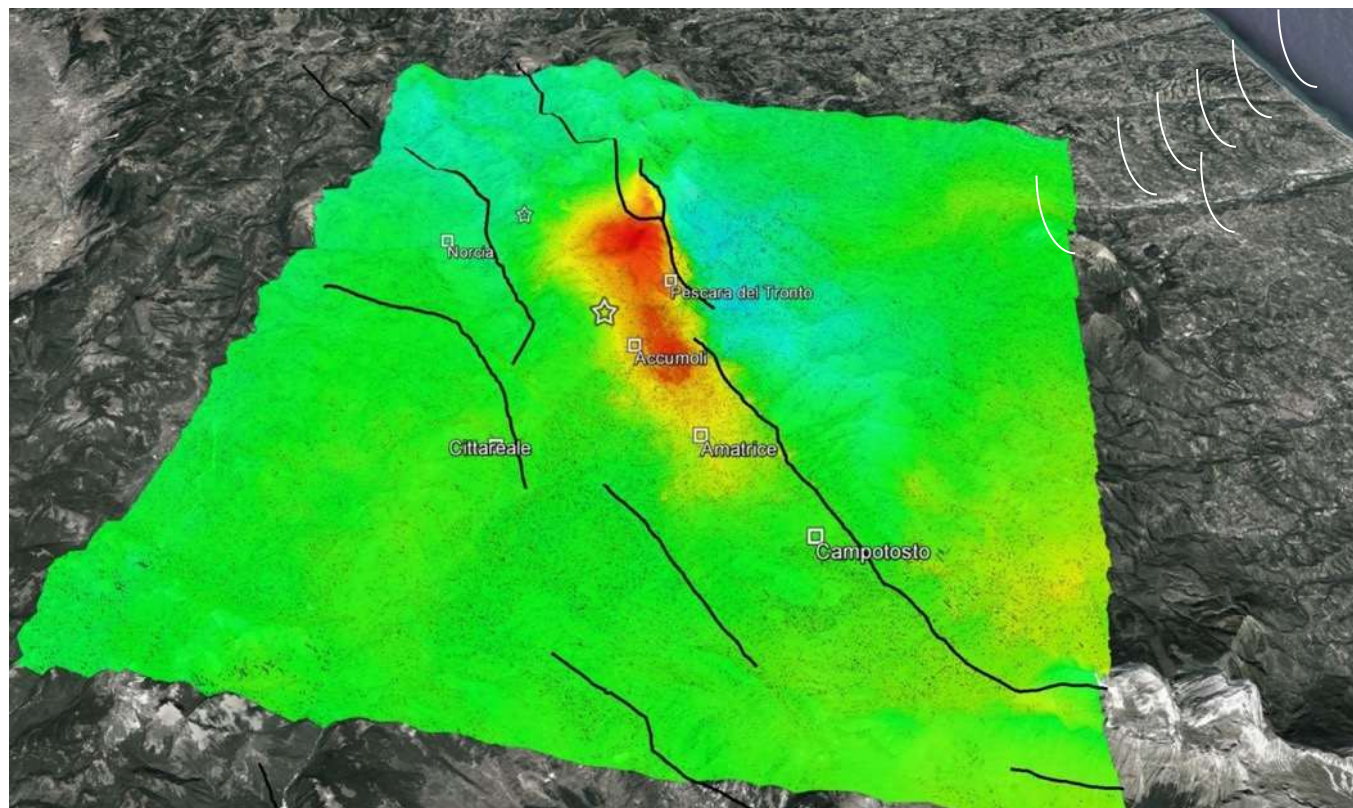



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Ground Displacements Measured from Space

With the **DInSAR** (or **InSAR**) technique, we can measure ground displacements with centimeter to millimeter accuracy by combining two SAR acquisitions collected at different times

Displacement map relevant to the 2016 Amatrice earthquake (Italy)

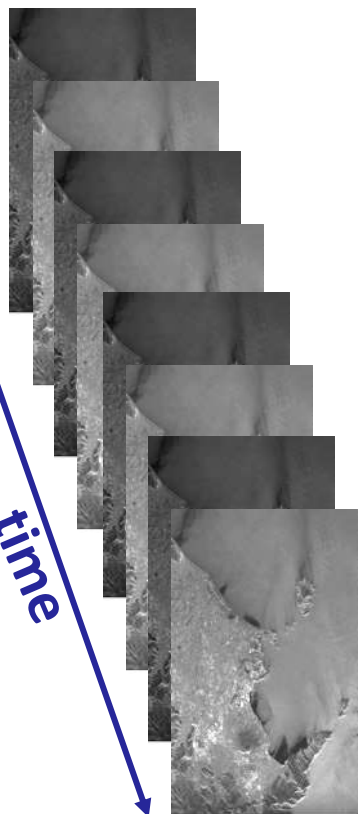


<-20  >20
LOS Deformation [cm]

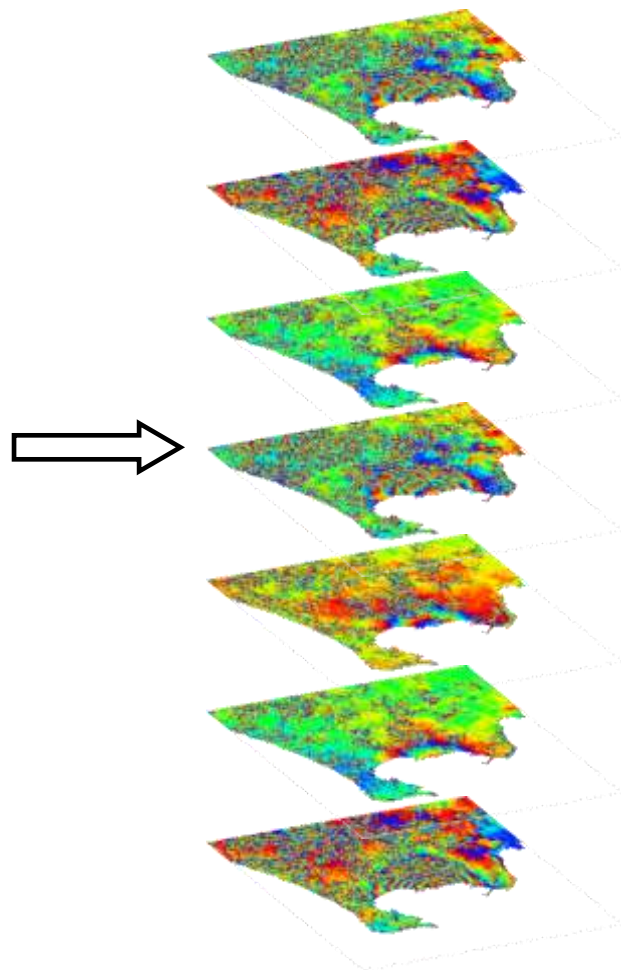


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Satellite SAR Images

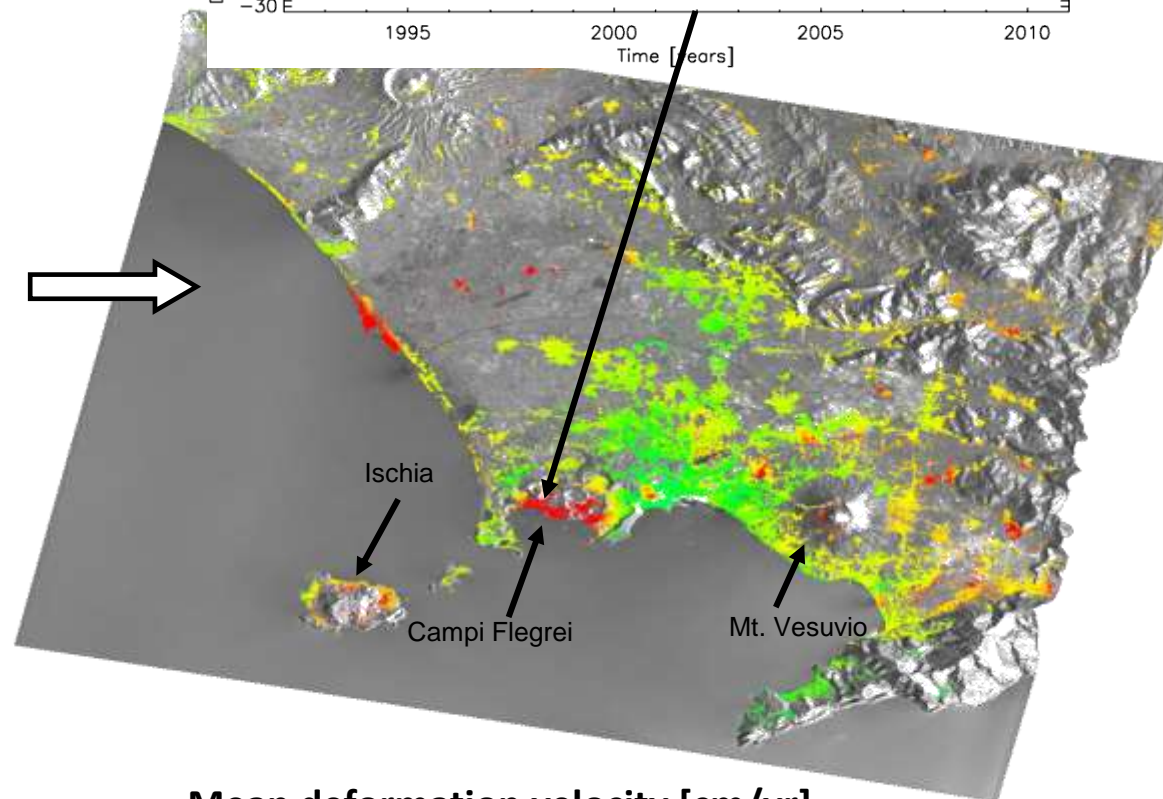
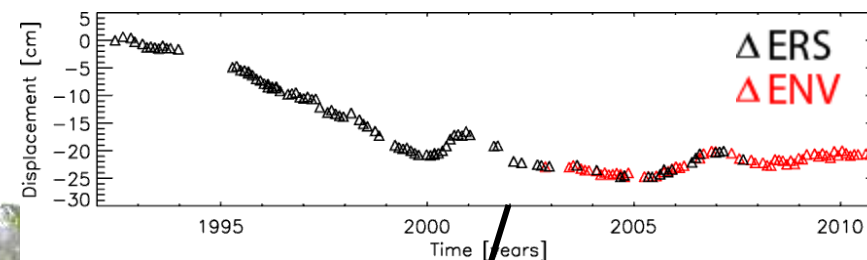


Interferograms



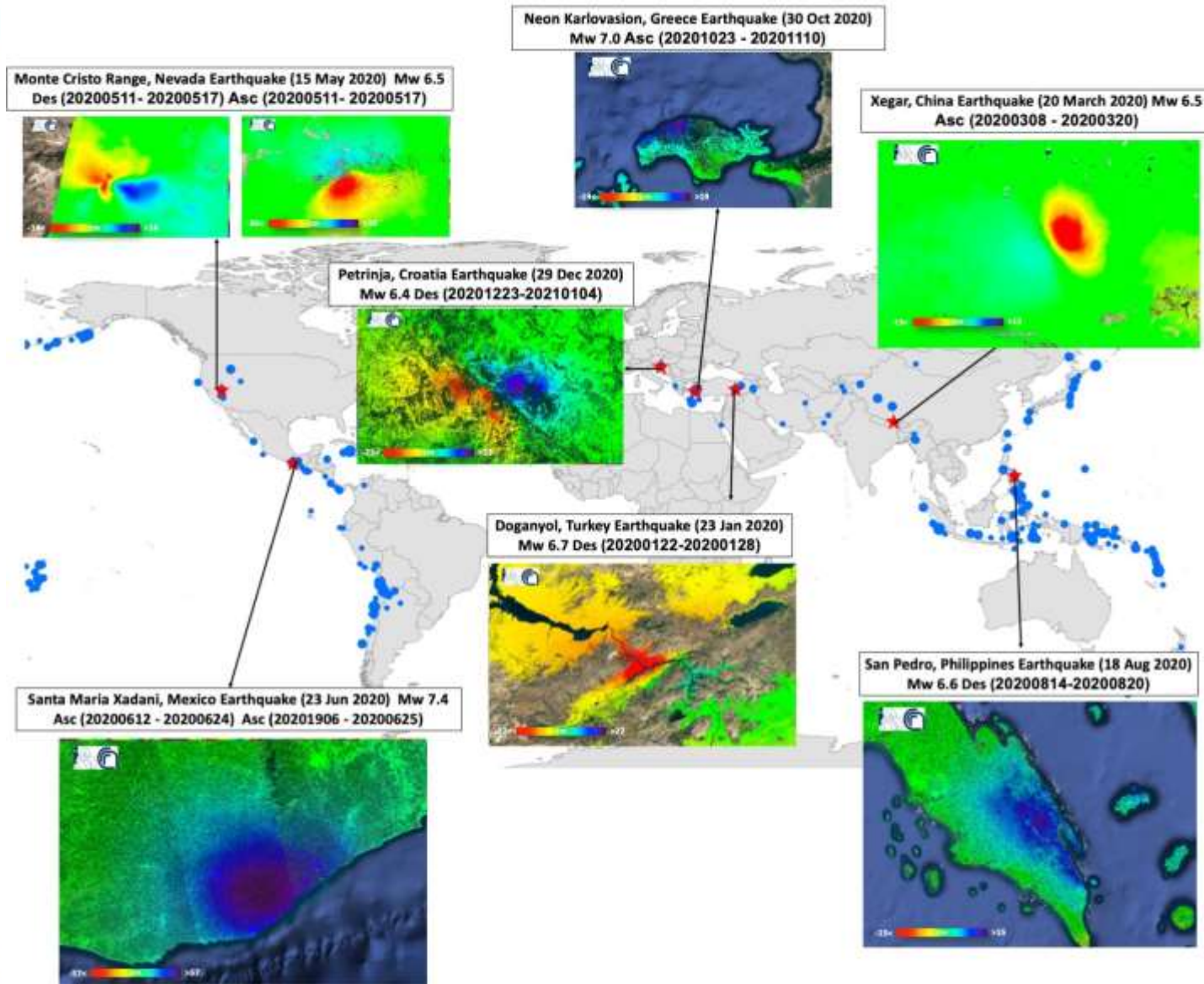
Advanced DInSAR Products

ERS/ENVISAT images (1992 – 2010)





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EPOSAR service

Copernicus Programme provides quasi-real-time satellite images. EPOS exploits this service to make updated displacement maps for each seismic event (Mw >5) on land available to the user community.

EPOSAR works at a global scale



EPOSAR service over Reykjanes area (Island)

The screenshot displays the EPOS 1.0.24 web interface. On the left, there is a search and filter panel with the following details:

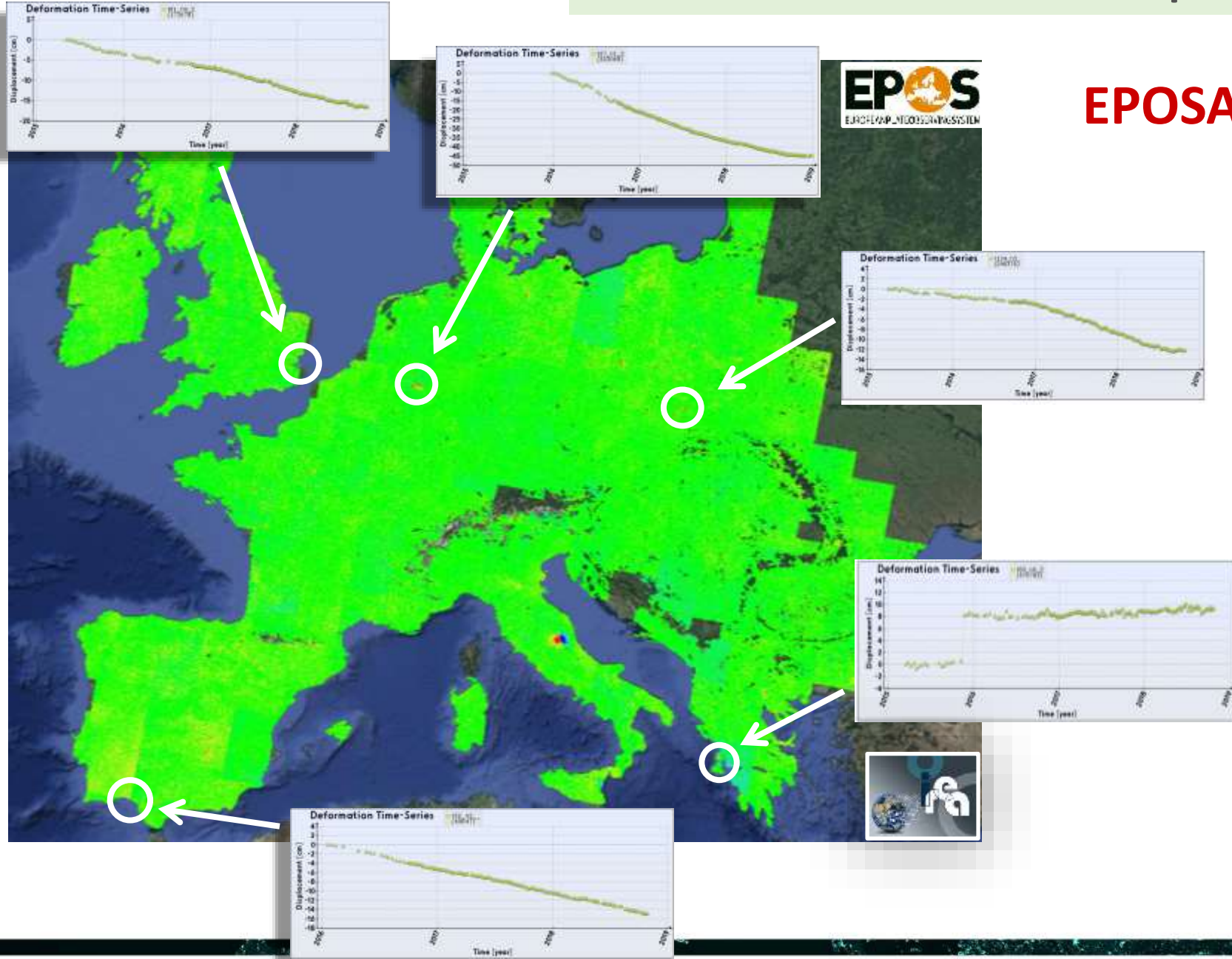
- Search: Free text search
- Filters: Search
- Coordinates: 64.18964, 63.64138, -23.19763, -21.50574
- Time Range: Last Month, Last Week, Last Day
- Data and Service Providers
- Data visualization: Clear All

The main map area shows a satellite line of sight over the Reykjanes area, with a color scale ranging from -40s (red) to 040s (blue). The legend for the 'Unwrapped interferograms' is visible on the right, showing the 'Satellite Line of Sight' scale and the product name 'BU_CNRIREA_20231031_20231112_GSD'.



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Mean deformation velocity [cm/year]



EPOSAR service



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TCS Satellite Data Operative Services

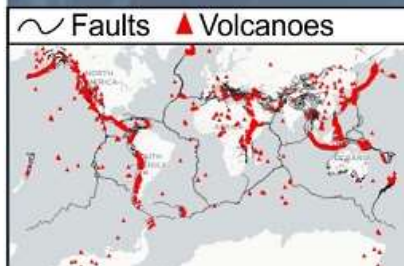
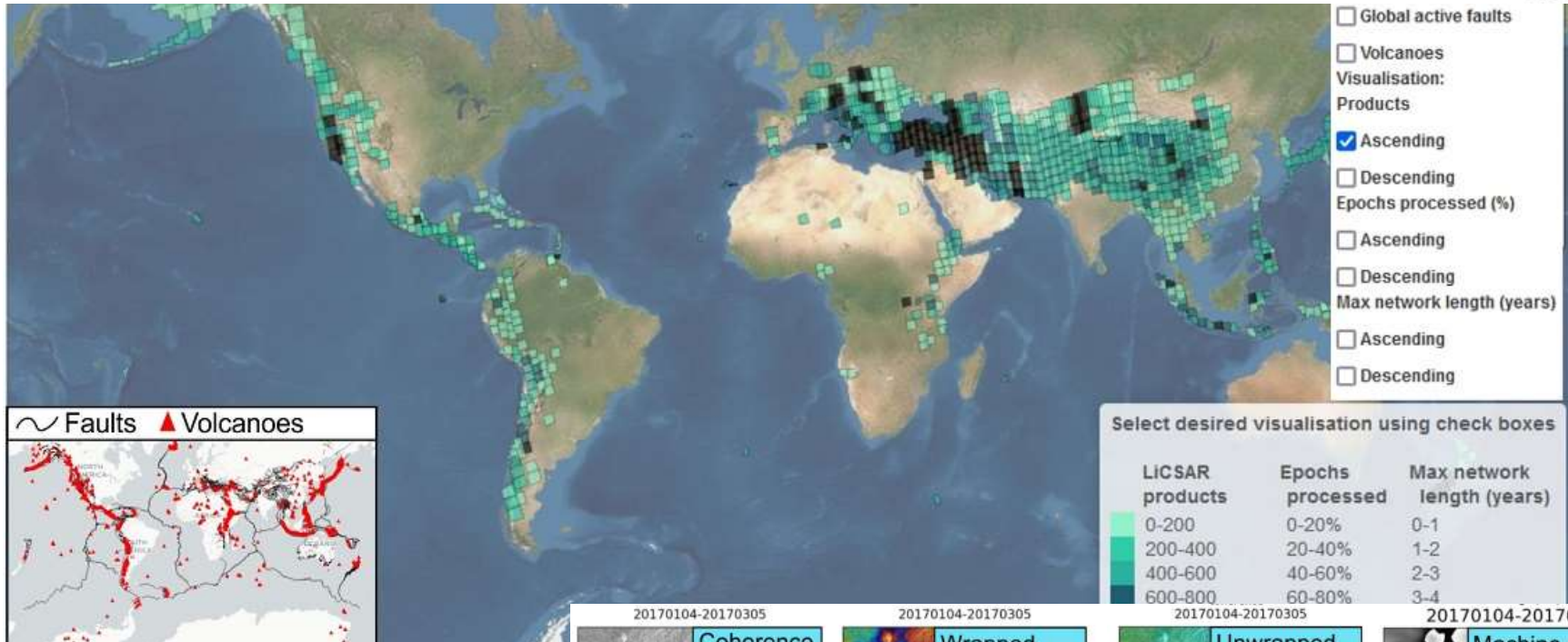


COMET-LiCS Sentinel-1 InSAR portal

<https://comet.nerc.ac.uk/comet-lics-portal>

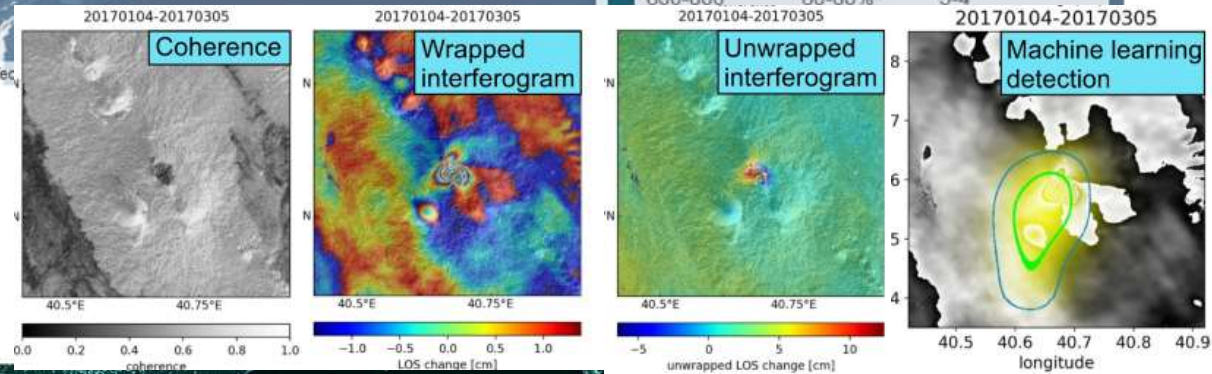


EUROVOLC



As of May 2022:

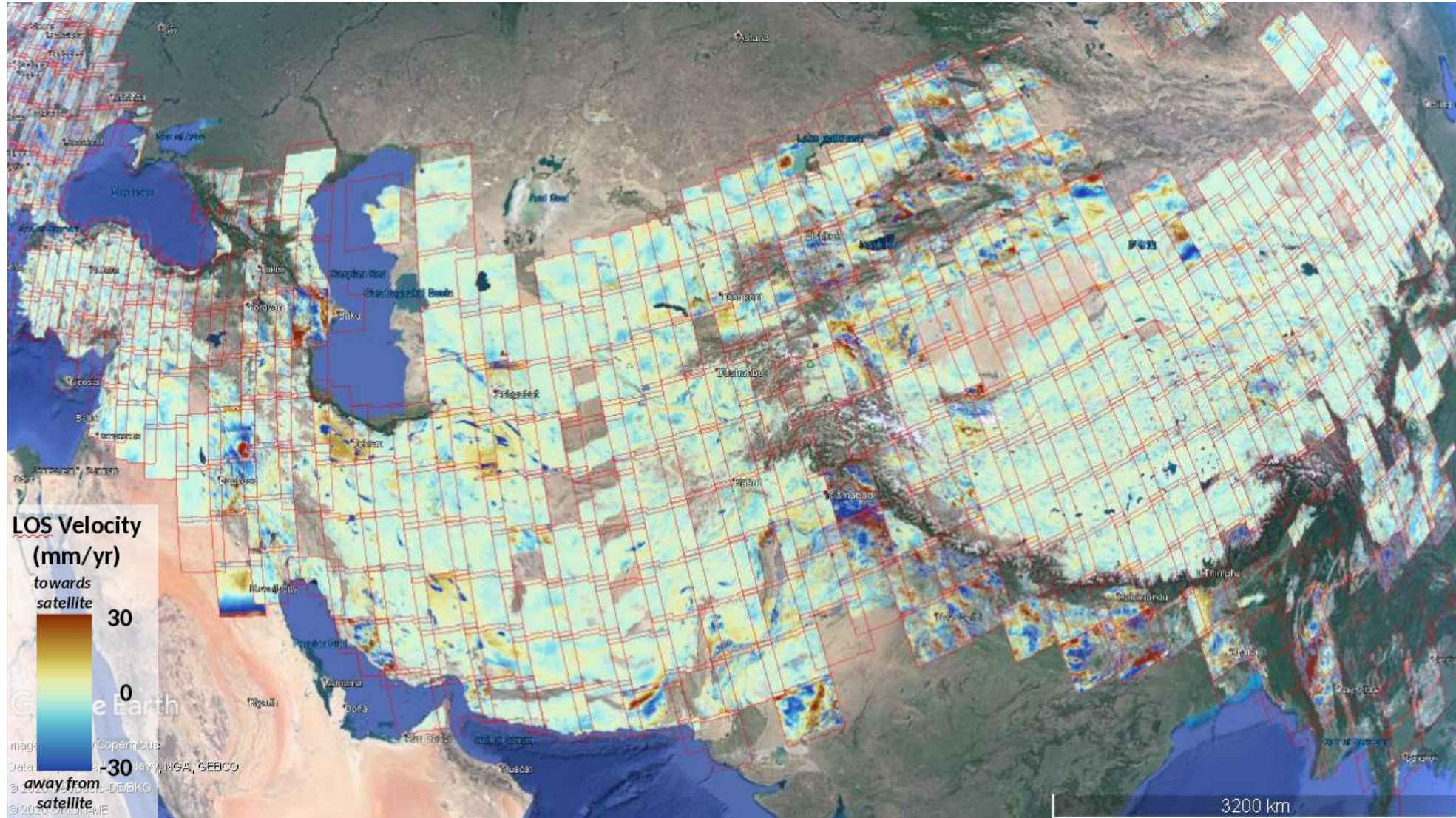
Number of	
Frames	2400
Processed S-1 acquisitions	279,000
Generated interferograms	830,000





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LOS velocity over Alpine-Himalayan Belt from Sentinel-1 interferograms



LOS Velocity
(mm/yr)
towards
satellite



away from
satellite



SATELLITE DATA

TCS Future Services: On-demand InSAR Processing

EARTH CONSOLE

- Home
- Claudio
- Processing Hours: 99.89
- Datasets
- Processors
- + New Task**
- My Tasks
- Messages
- About
- Logout

SBAS for S1 test: New Task

Follow the steps to create a new Task

< 3 Products Selection

X CANCEL

PROCESSOR INPUTS >



Select All 10 Products < 1 - 10 of 763 >

<input checked="" type="checkbox"/>		Identifier 1df60b0c-cacd-5bbb-8661-5710c90031b2	Title S1A_IW_SLC__1SDV_20160611T165646_20160611T1...	Orbit 44	i
<input checked="" type="checkbox"/>		Identifier 2445160a-abe5-55c0-b709-4c6c3aa89e89	Title S1A_IW_SLC__1SDV_20160611T165712_20160611T1...	Orbit 44	i
<input checked="" type="checkbox"/>		Identifier 4007e47c-a255-5a61-85d6-2131e0ead7d	Title S1A_IW_SLC__1SDV_20160705T165713_20160705T1...	Orbit 44	i
<input checked="" type="checkbox"/>		Identifier 41229ac3-ddb8-50c6-8b43-4fed522092ed	Title S1A_IW_SLC__1SDV_20160705T165642_20160705T1...	Orbit 44	i
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<input checked="" type="checkbox"/>		Identifier d871bbfd-06bd-59c7-b3dd-b65246838e98	Title S1A_IW_SLC__1SDV_20160729T165714_20160729T1...	Orbit 44	i
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<input checked="" type="checkbox"/>		Identifier 7f102180-4184-5327-bf6d-44182365e3ed	Title S1A_IW_SLC__1SDV_20160810T165649_20160810T1...	Orbit 44	i

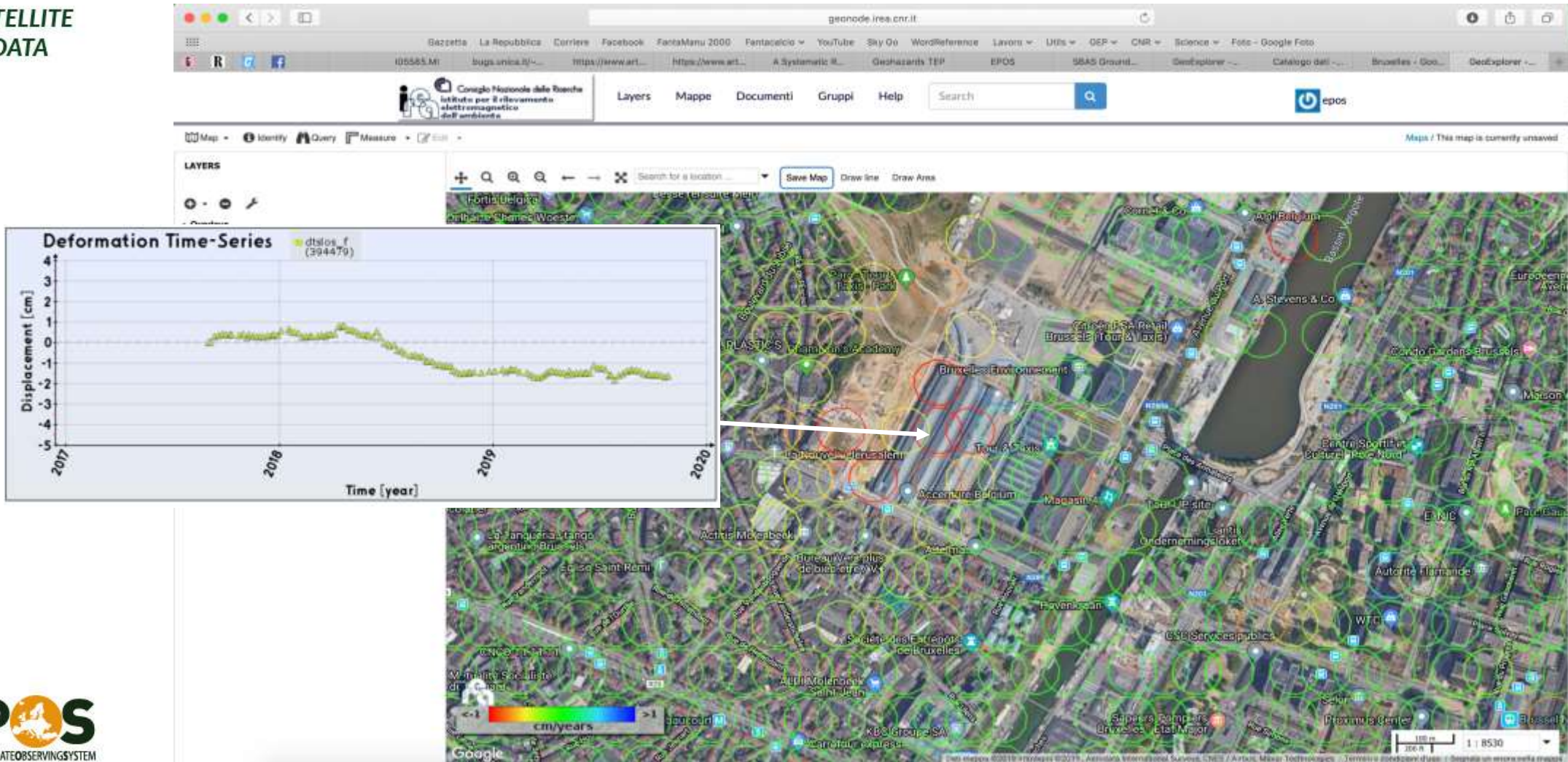




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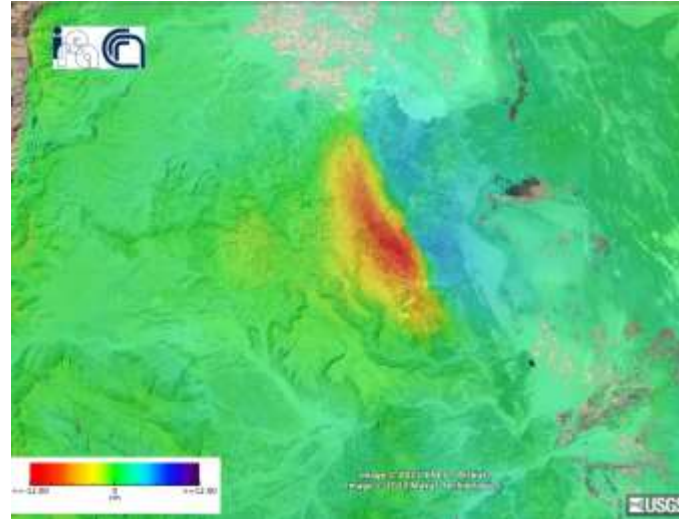
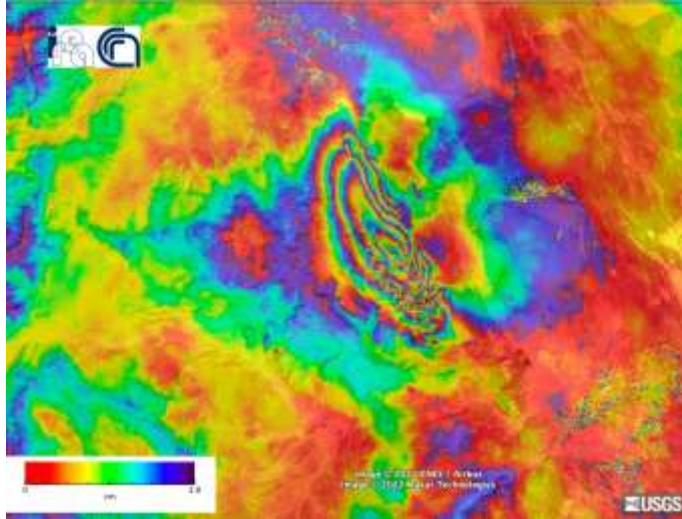
TCS Future Services: On-demand InSAR Processing

Gare Maritimes in Bruxelles (BE)



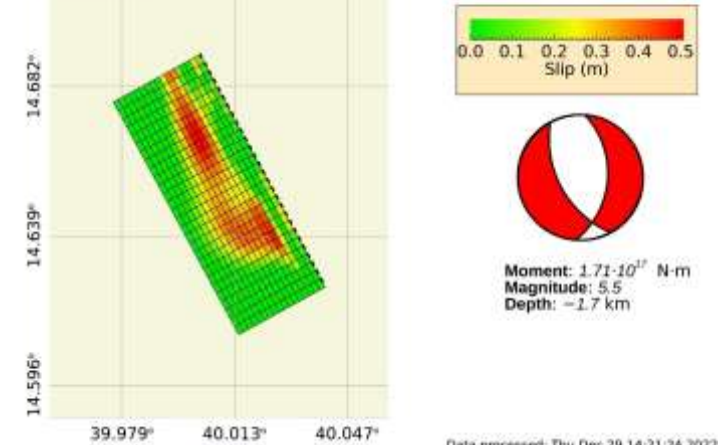


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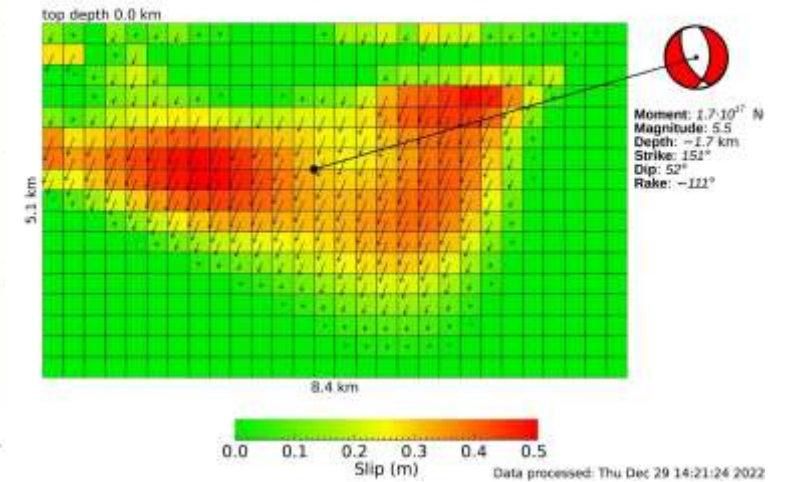
TCS Future Services: Seismic Source Automatic Modeling

M 5.5 64 km ENE of Adigrat, Ethiopia
(26/12/2022, 12:21 UTC)
Slip distribution from geodetic data

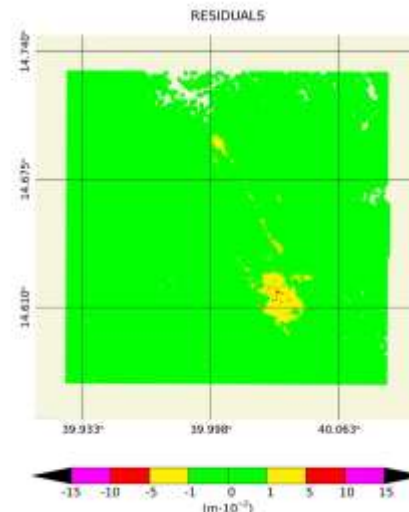
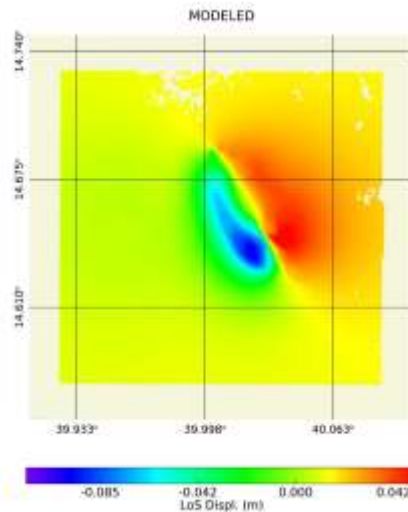
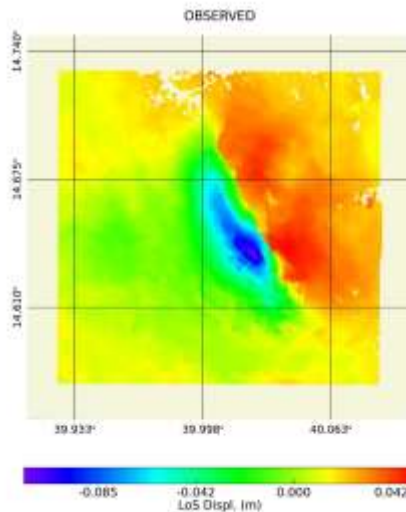


Data processed: Thu Dec 29 14:21:24 2022

Slip distribution from geodetic data
Strike/Dip coordinate system



Data processed: Thu Dec 29 14:21:24 2022



Thank you!!!

