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# **Surface Loading on GNSS Stations in Africa**

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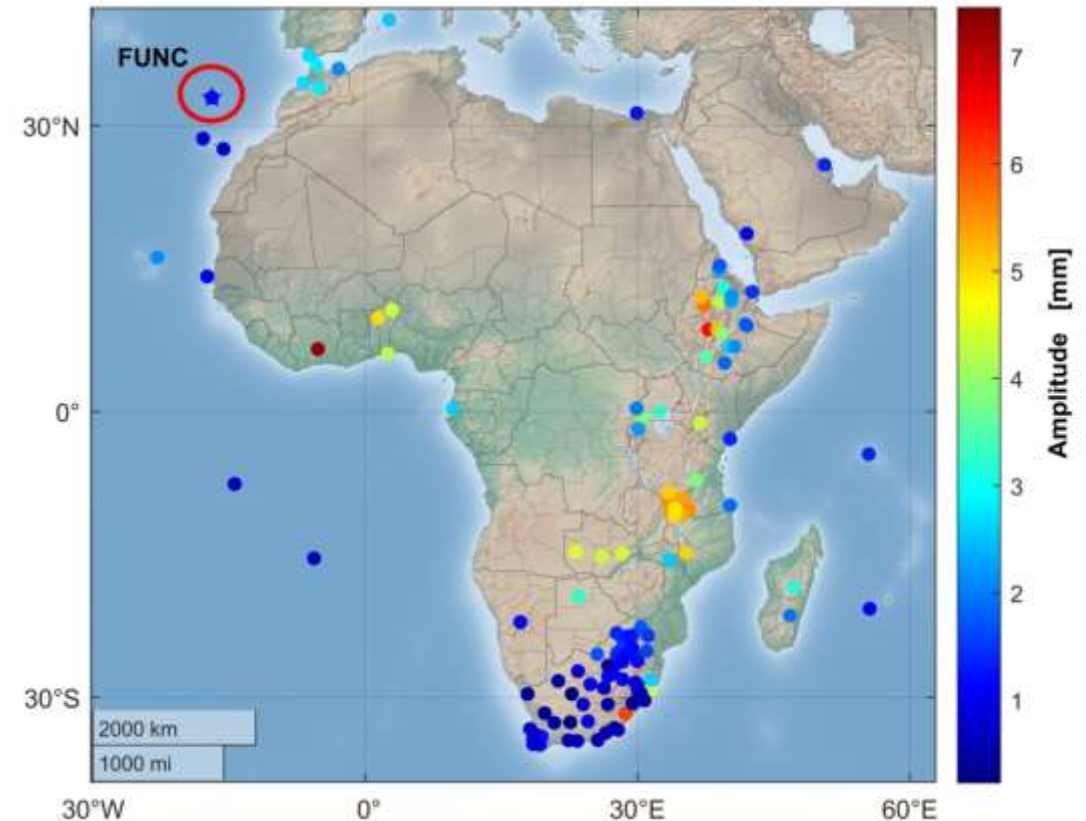
## Aim:

❖ Correct loading effect to model the seasonal deformation at GNSS stations in Africa

## Objective:

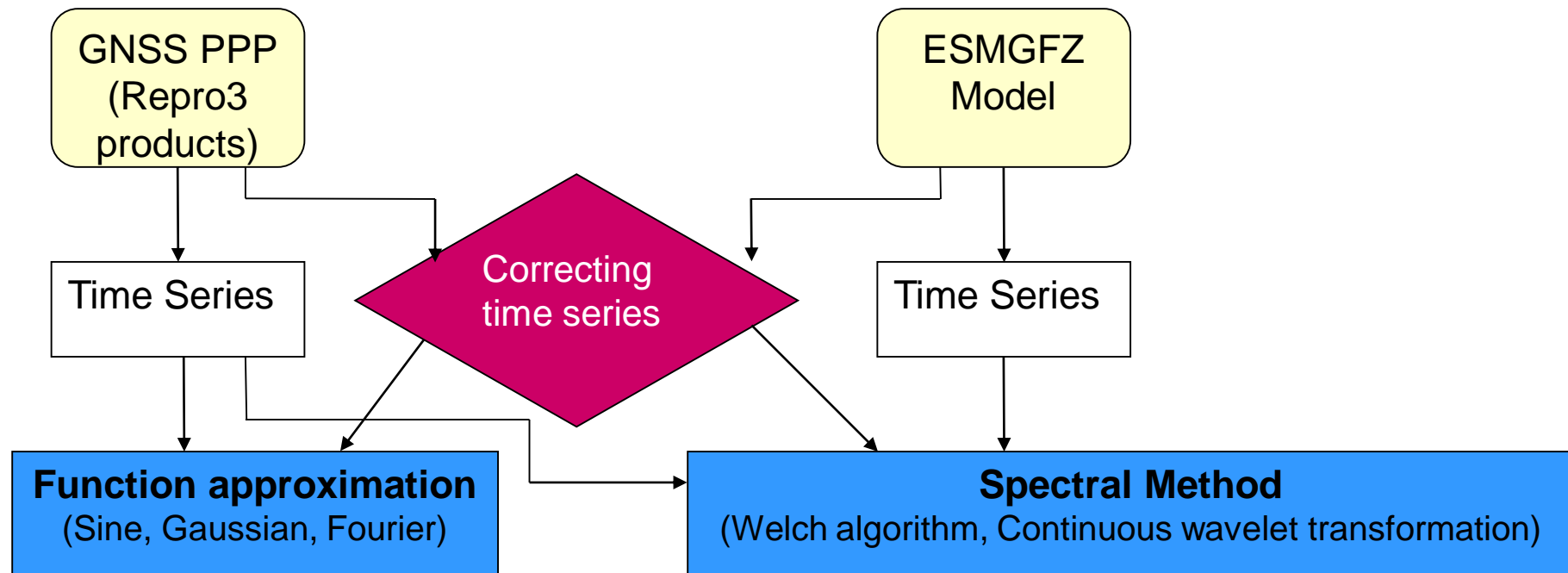
❖ To evaluate the effect of hydrological loading on GNSS time series in Africa

Variation amplitude of Hydro-loading at GNSS stations (Sin-8 functions)

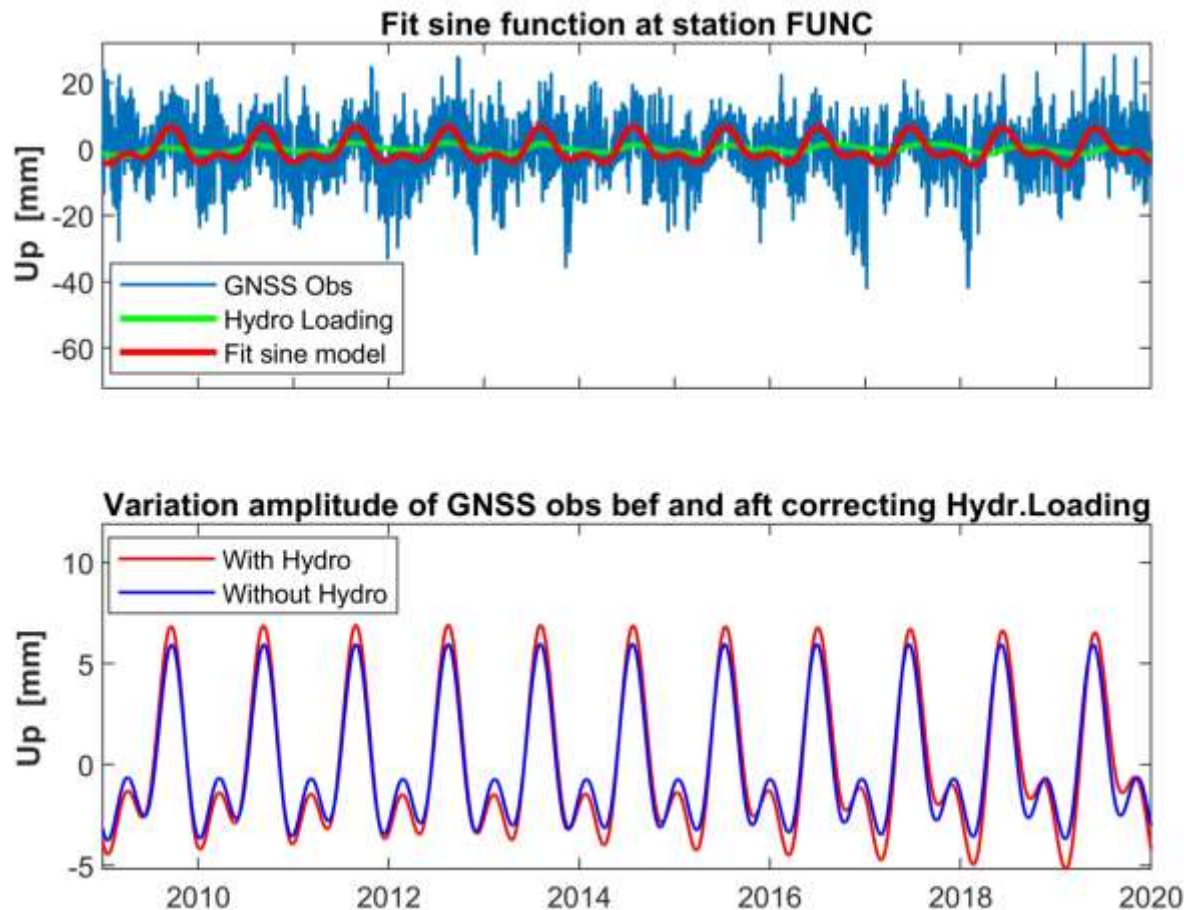


Amplitude variation of the hydrological loading model in Africa

## Flowchart showing the processing strategies



## Correct Hydrological loading effects for GNSS time series at station FUNC



### Correct Hydro loading effect:

- Variation amplitude of Hydro loading: 1.13 mm

- Variation amplitude of GNSS time series:

#### Before:

- GNSS time series: 4.20 mm

- Fluctuations up to: 6.91 mm

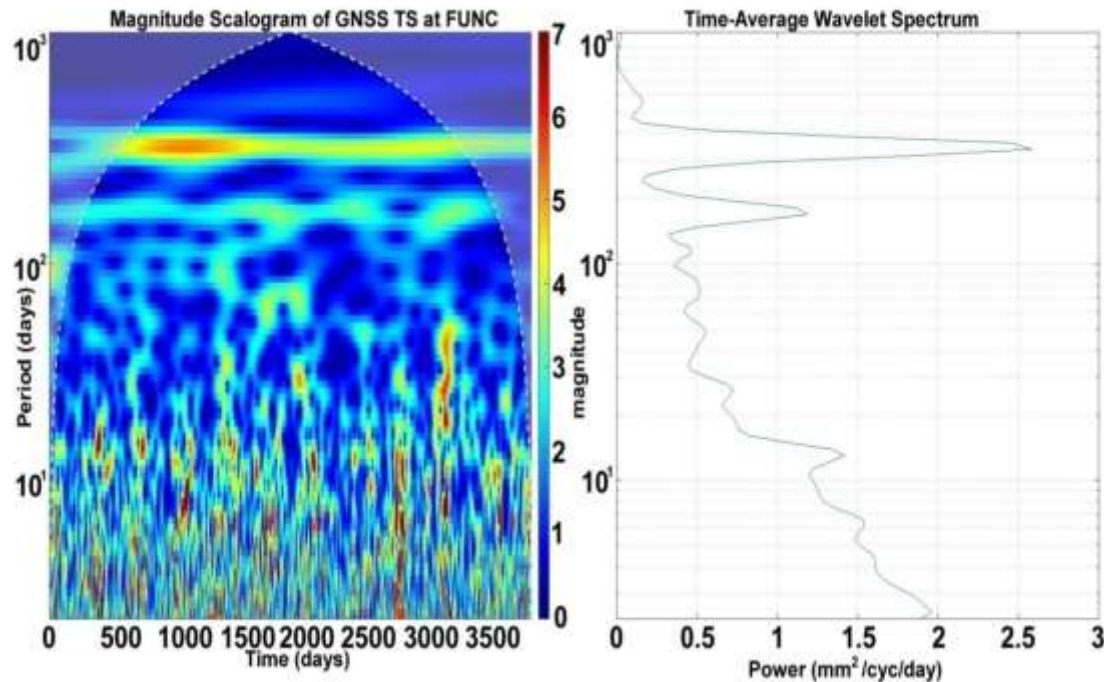
#### After:

- GNSS time series: 3.35 mm

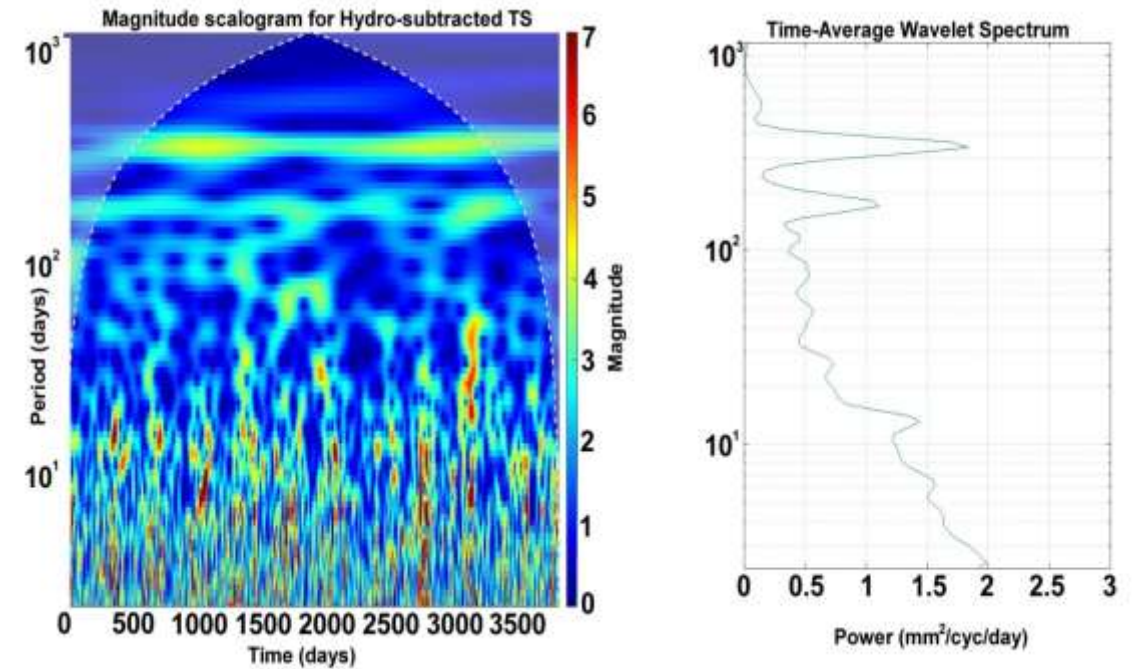
- Fluctuations: 5.97 mm

Correct Hydrological loading effect for GNSS time series  
at station FUNC

## Power Spectral Density (PSD) estimation for GNSS time series at station FUNC



(a)



(b)

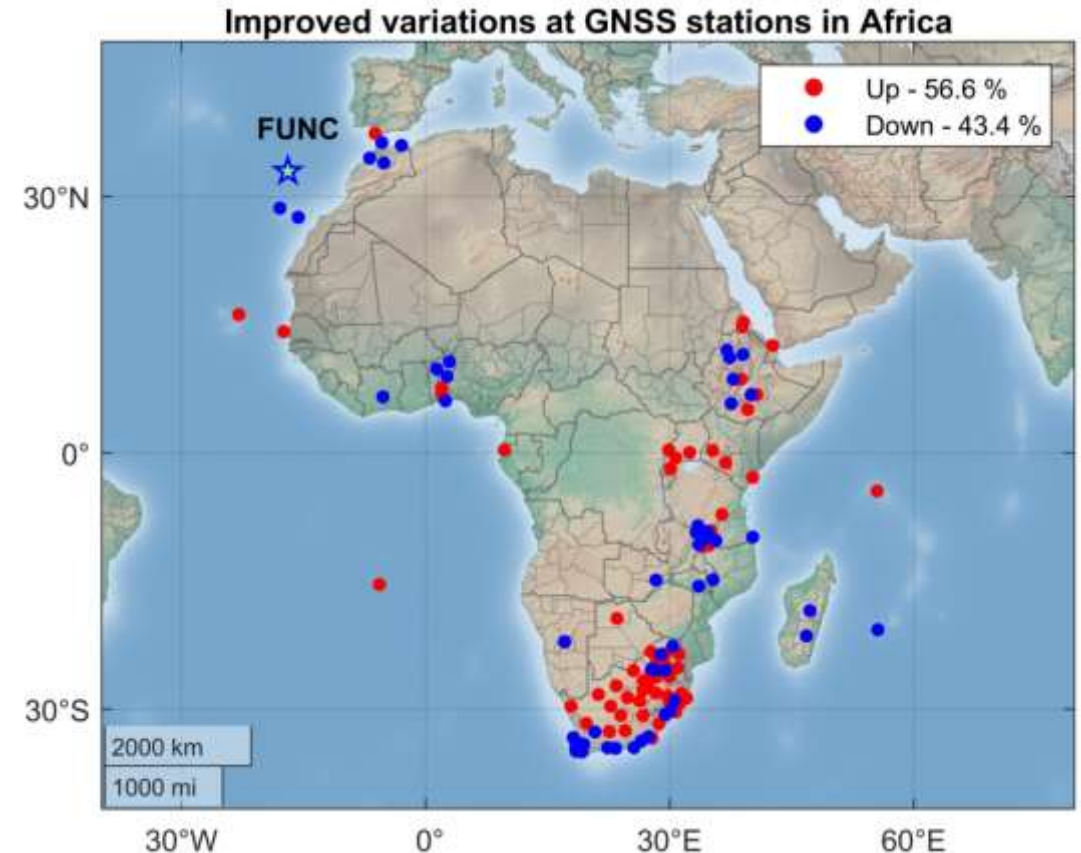
Power Spectral Density (PSD) estimation for GNSS time series at stations FUNC *before (a)* and *after (b)* correcting Hydrological loading effect

## Summary:

- Reduced variation in amplitudes: **43.4%** (of 145 investigated stations), we have a **considerable improvement** in amplitude at some GNSS stations along **the coastline** and **water storages**.

## Further work:

- More GNSS stations at **hotspots** (water runoffs) are needed to carry out detailed studies.
- Further investigation are necessary to **consider the effect of other loadings** (e.g. Sea level, Atmosphere, Ocean).



Thank you



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Thank You  
for  
listening