

Inter-calibration of INSAT-3D visible and SWIR bands using ray matching method

Munn Vinayak Shukla

Danish Hussain

Pradeep K Thapliyal

Space Applications Centre (ISRO) Ahmedabad, India

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GD AOSG/EPISA/SAC

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<https://mosdac.gov.in>

<https://earthdata.nasa.gov>

<https://satcorps.larc.nasa.gov>

Dr. Dave Doelling

GSICS VIS/NIR meeting 14th July 2022

- ✓ Methodology to find optimum thresholds
- ✓ A method for outlier removal.
- ✓ Time series of slope (passing through origin) and slope and offset
- ✓ Effect of different thresholds on time series

Method for finding optimum thresholds

Time difference, Satellite view angle difference, Sun zenith angle difference and Relative azimuth angle difference (varied from 5 to 30 with the increment of 5)

Standard deviation of scenes (varied from 25 to 75 with increment of 10)

All possible combinations (~7800)are taken.

Slope(s) and offset is computed for all possible combination.

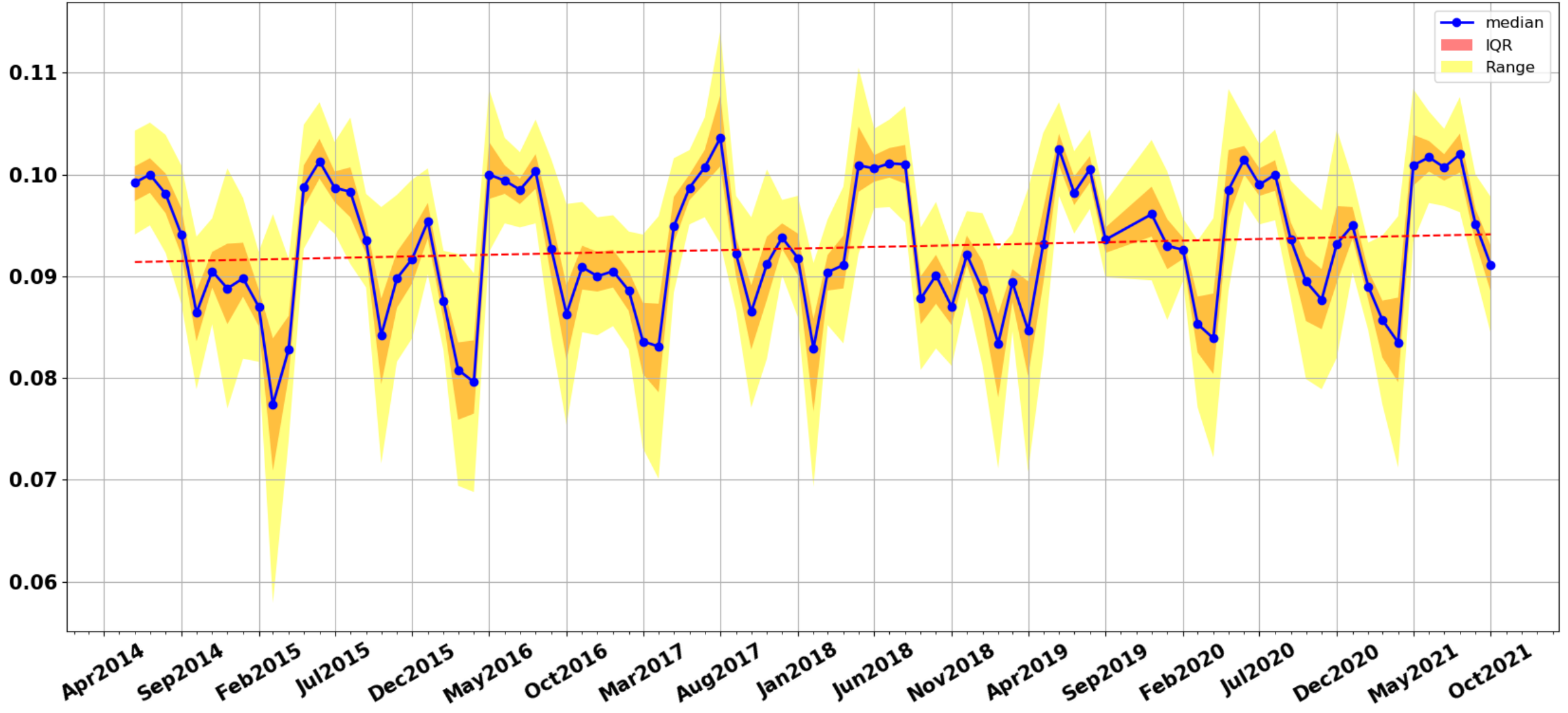
SWIR

Slope1= Slope of best fit line with offset

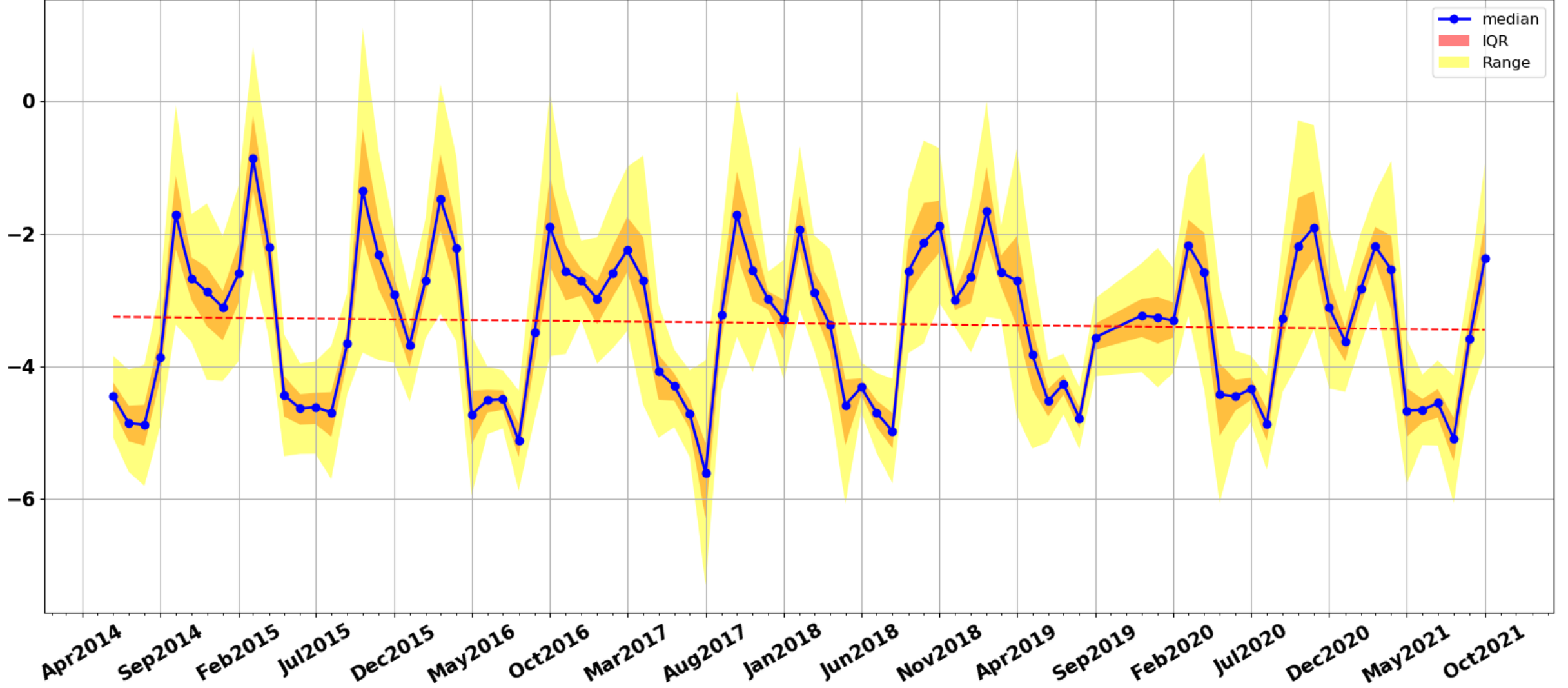
Offset=offset of best fit line

Slope2= Slope of best fit line passing through origin

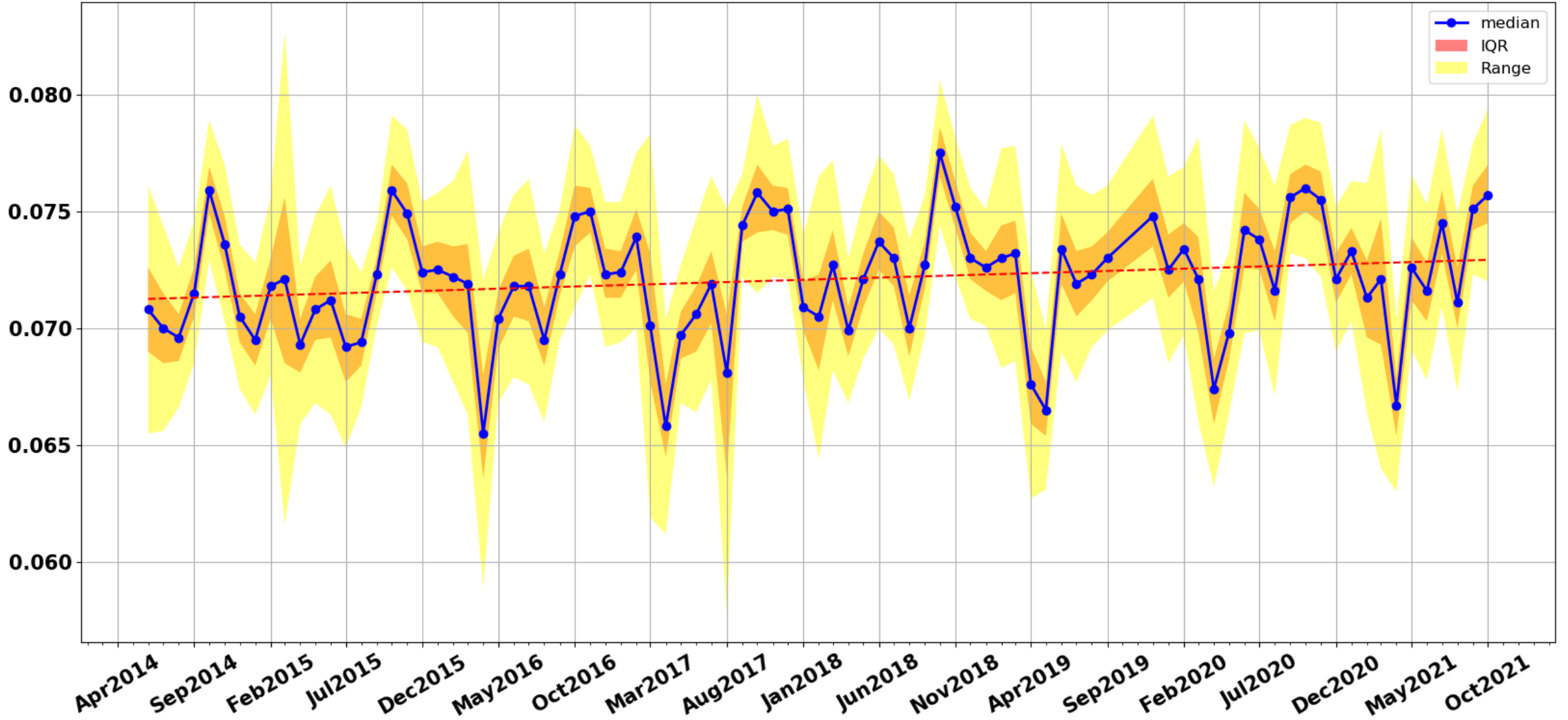
Time series of slope1



Time series of offset

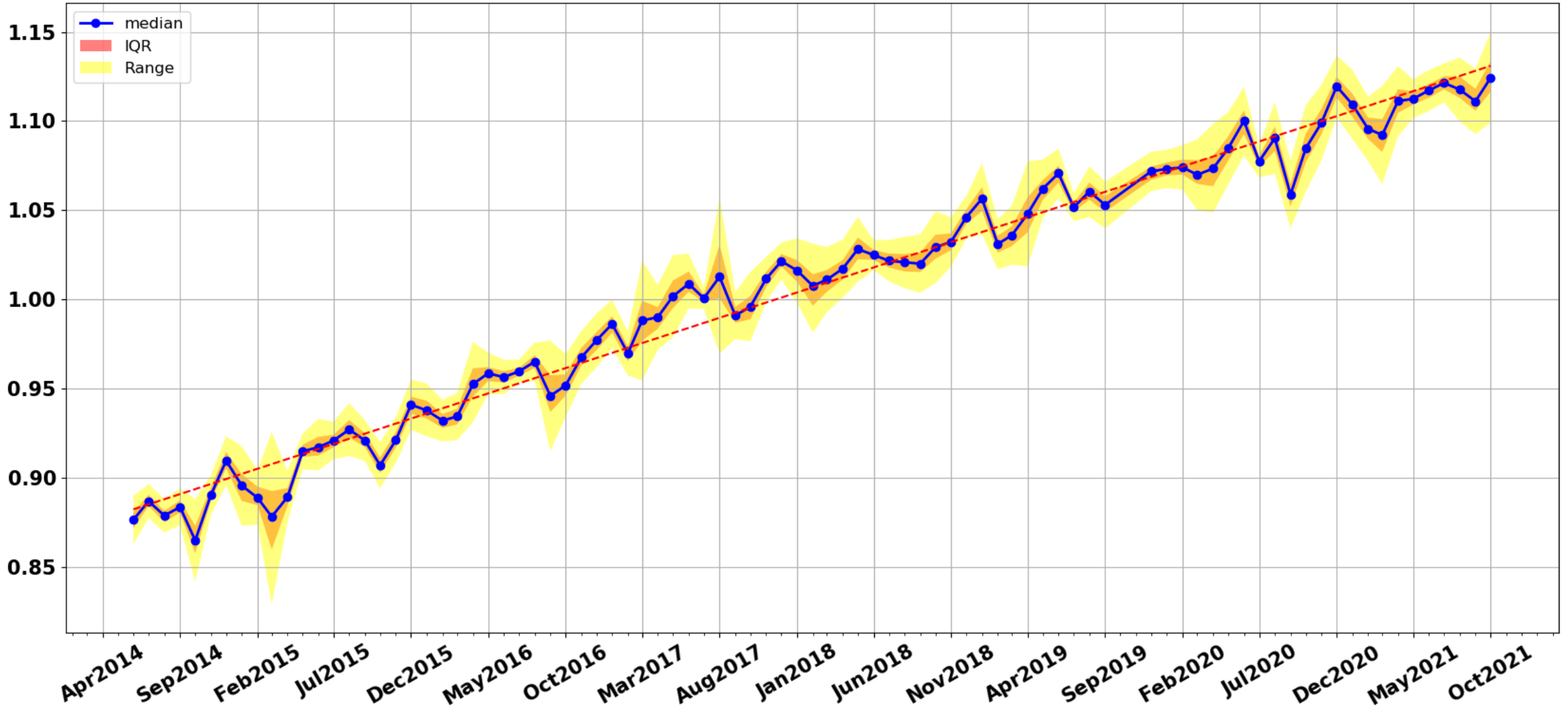


Time series of slope2

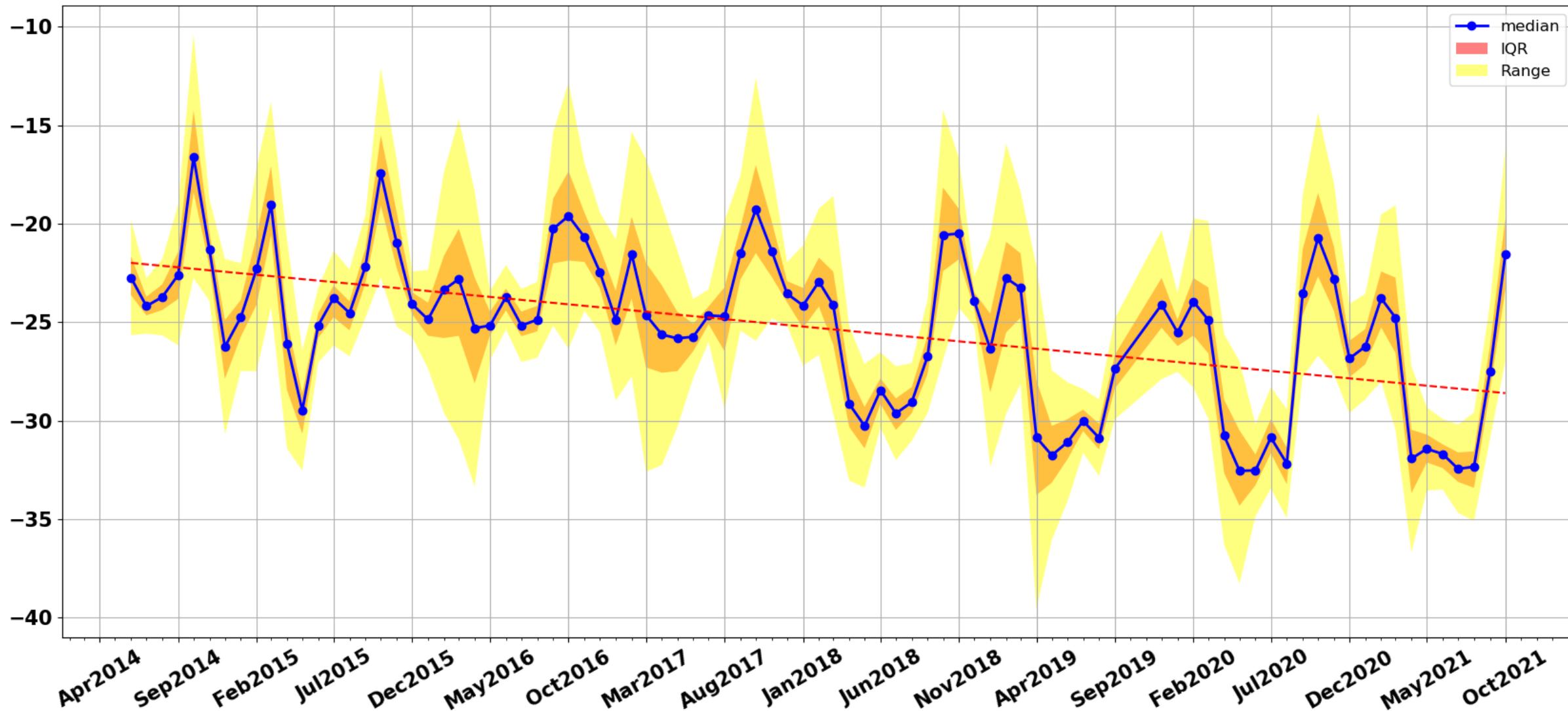


Visible

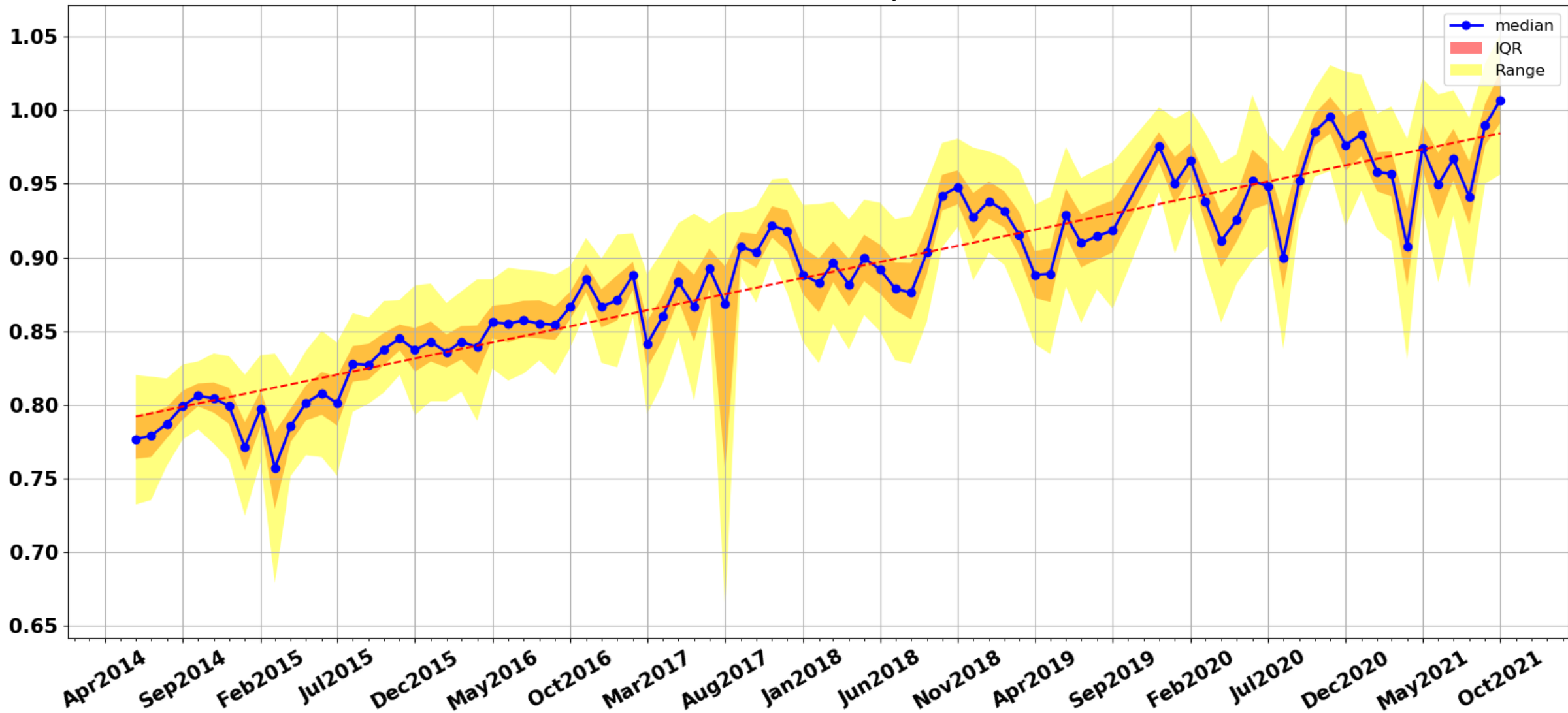
Time series of slope1



Time series of offset

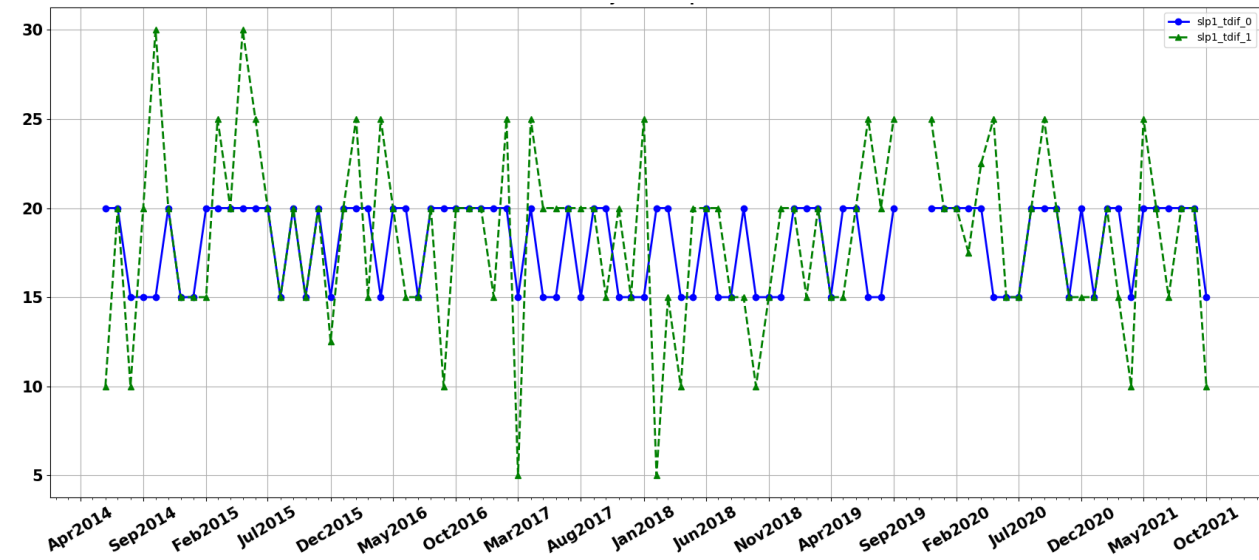


Time series of slope2

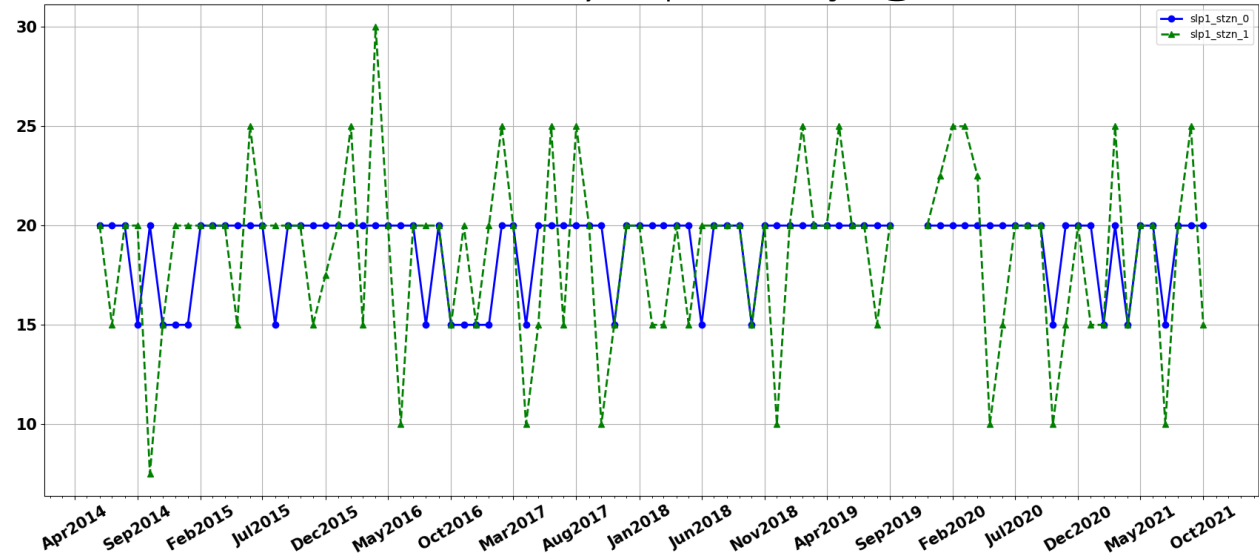


Time series of thresholds computed for slope1
And number of points
(Visible)

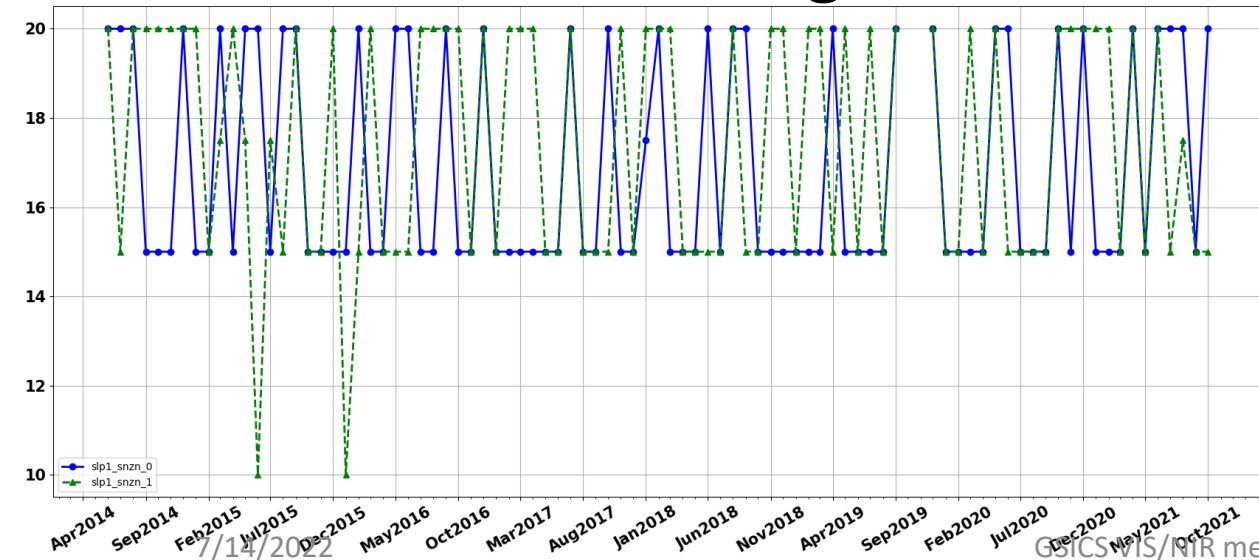
Time difference



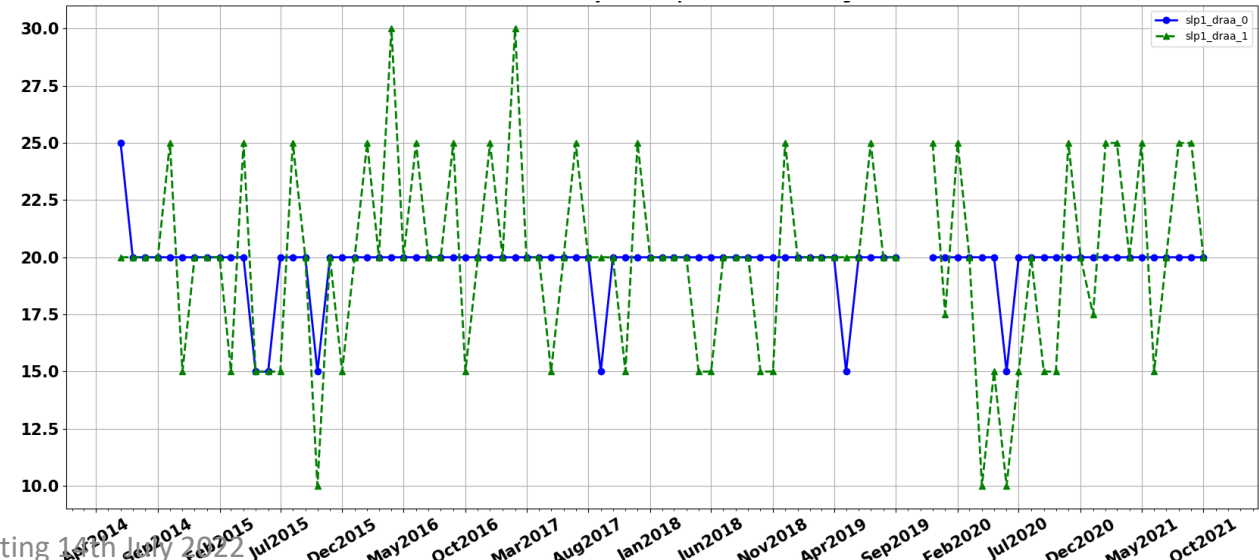
Satellite view angle



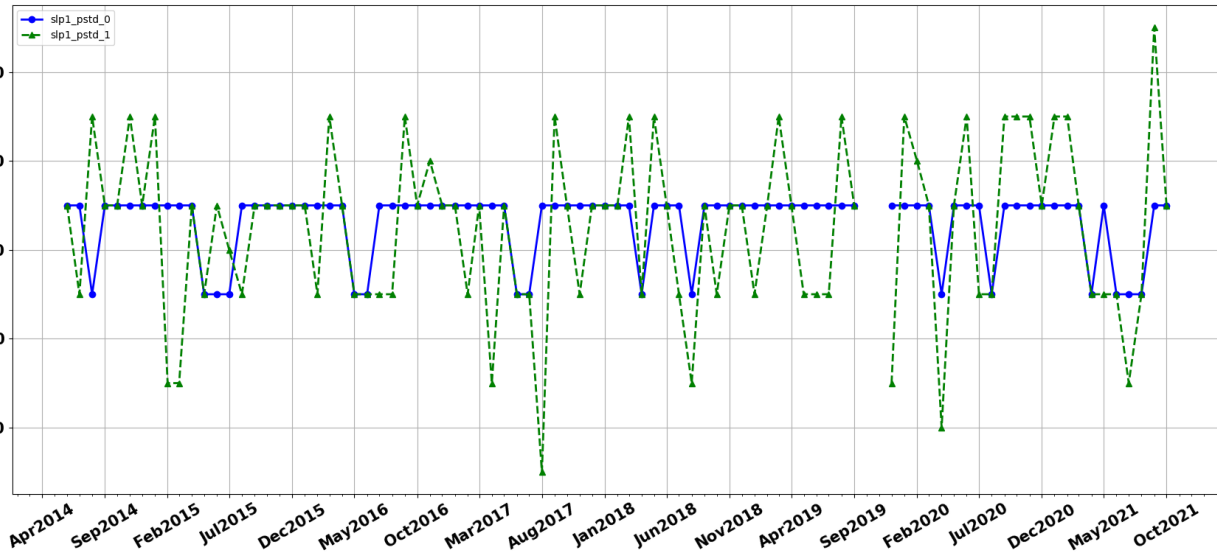
Sun zenith angle



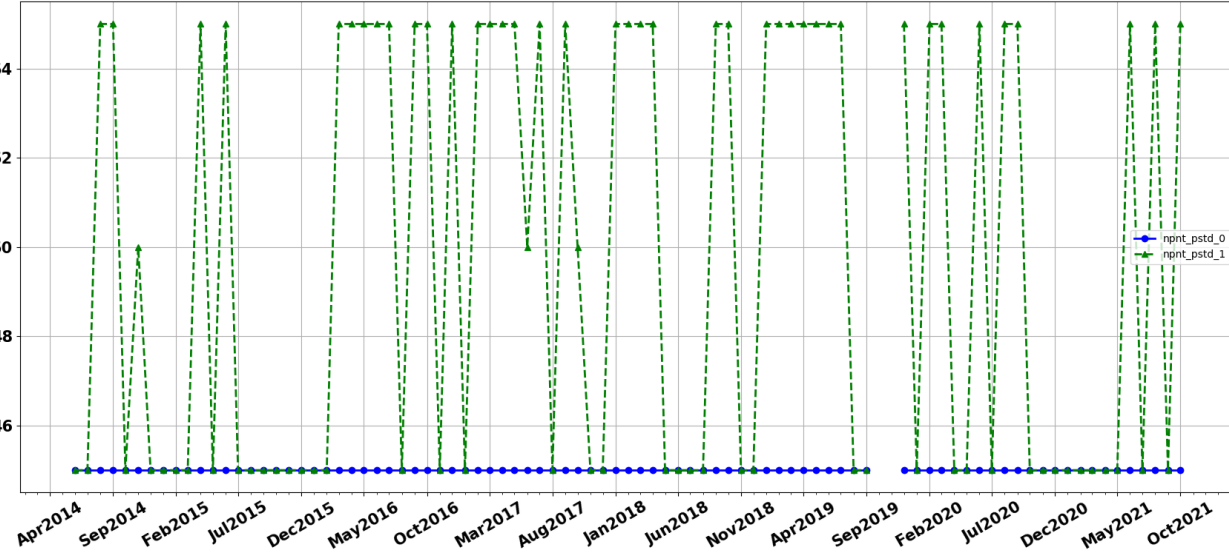
Relative azimuth angle



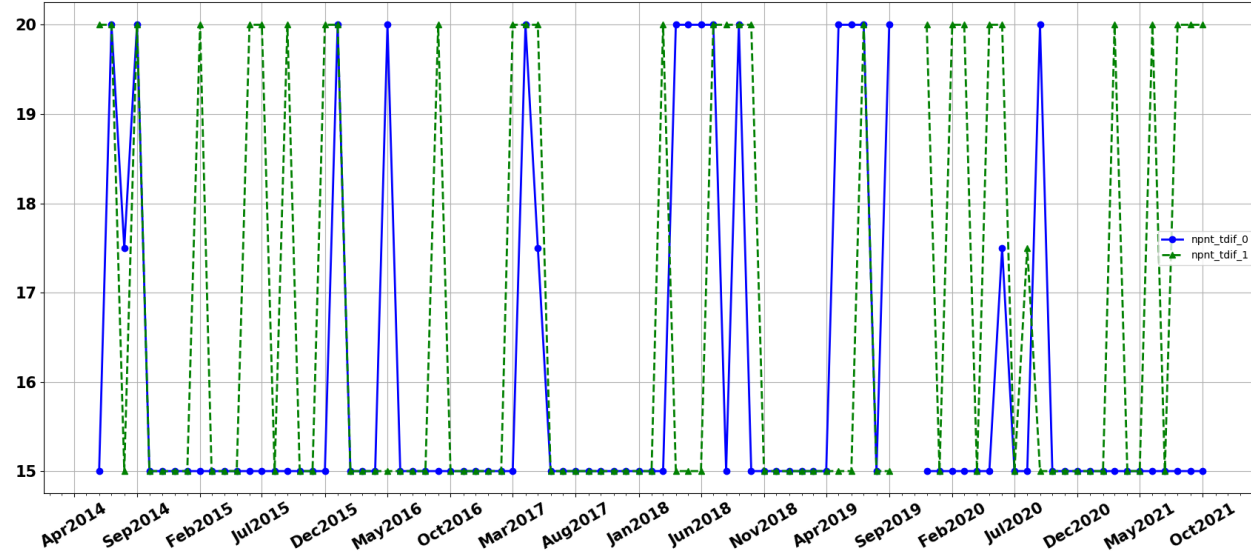
% standard deviation (Slope1)



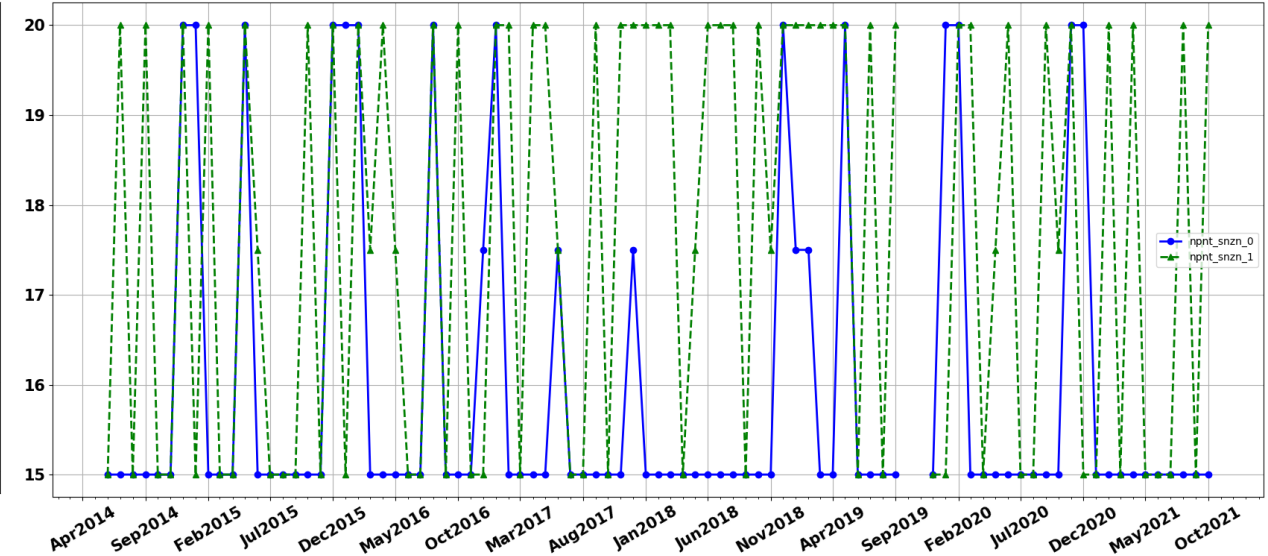
% standard deviation (number of points)



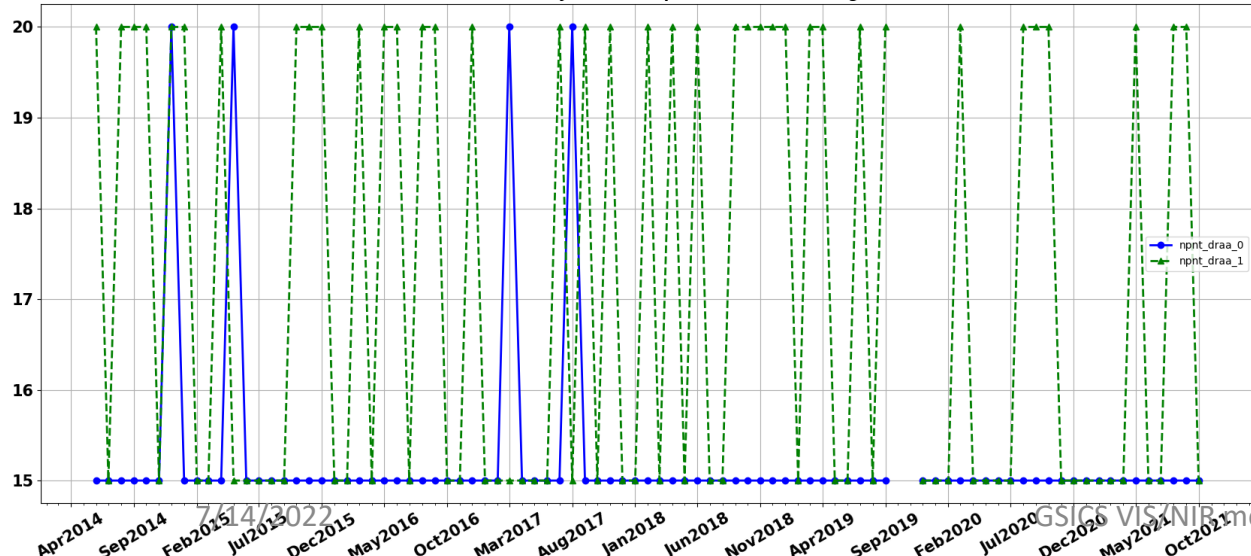
Time difference



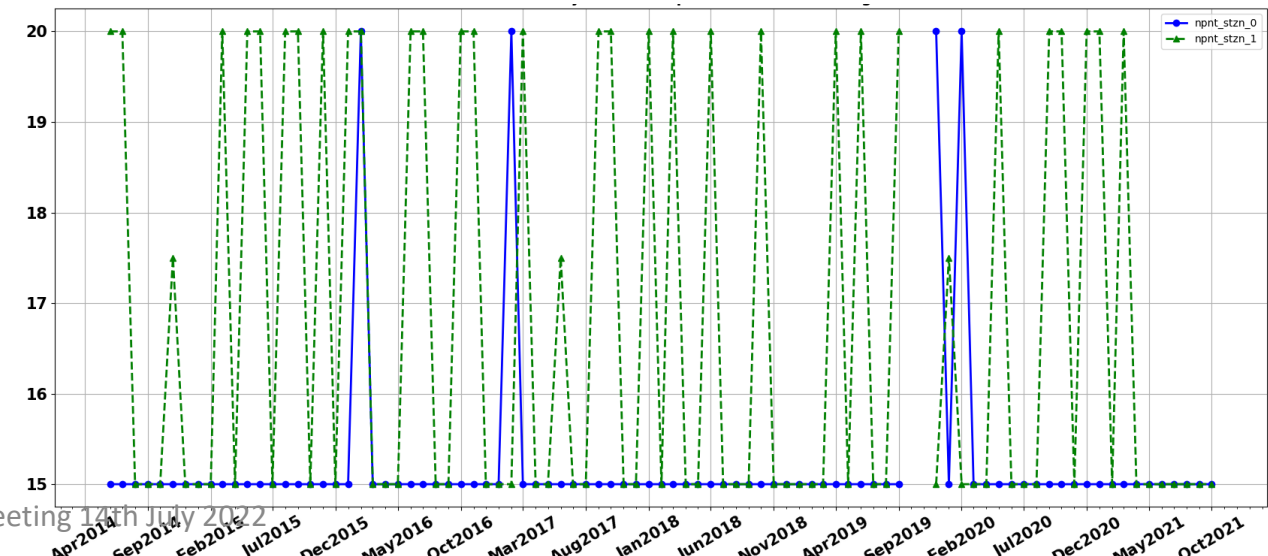
Satellite view angle



Sun zenith angle

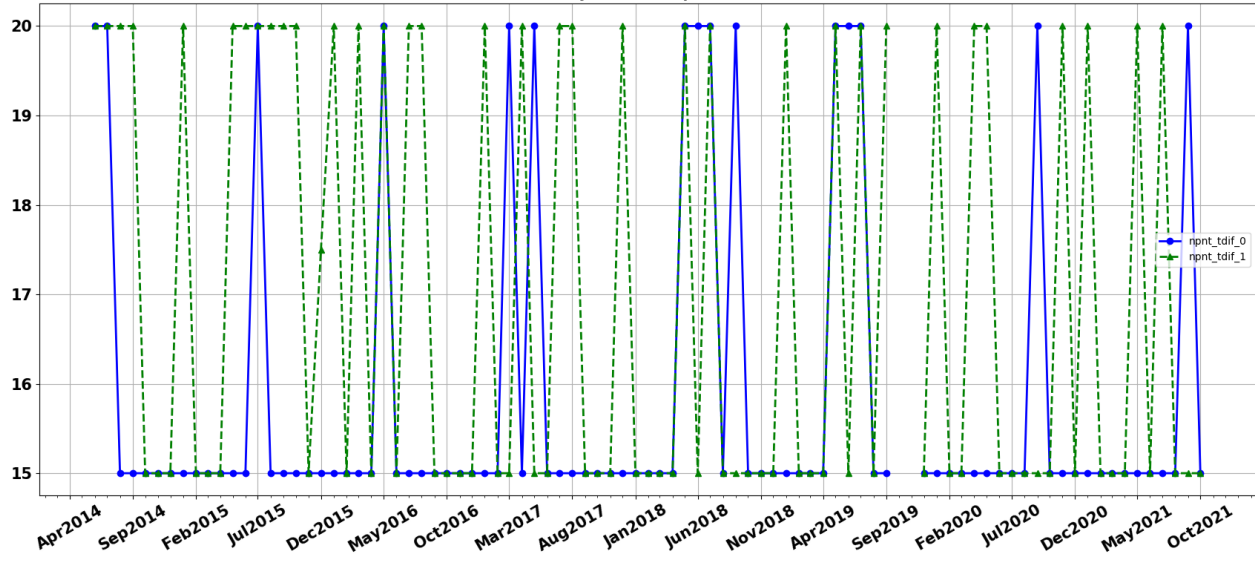


Relative azimuth angle

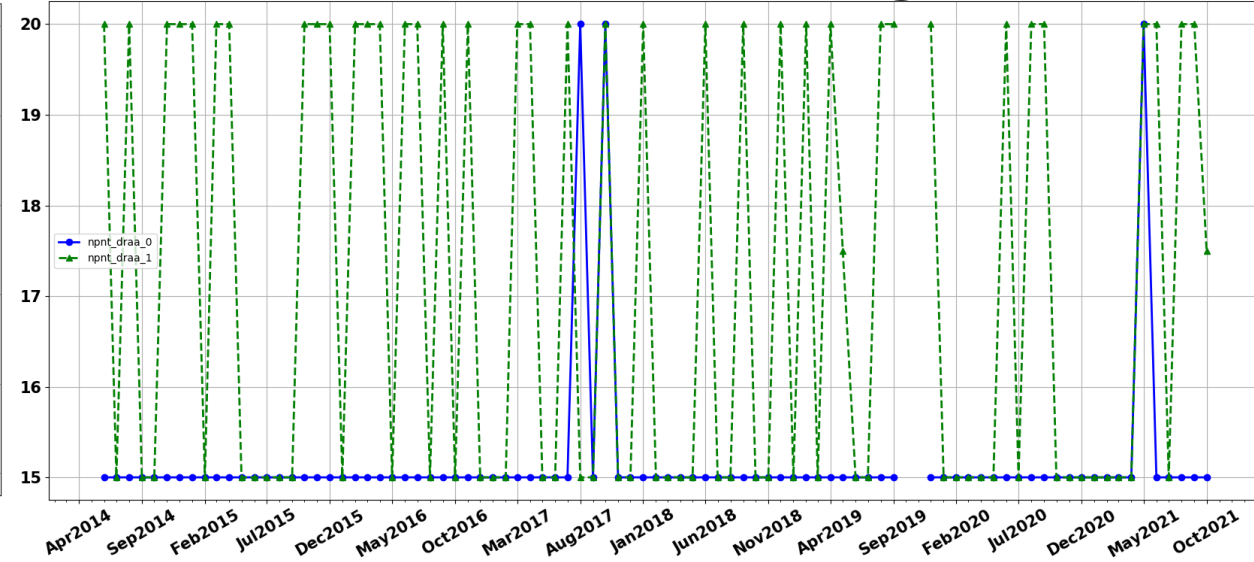


Time series of thresholds computed for slope1
And number of points
(SWIR)

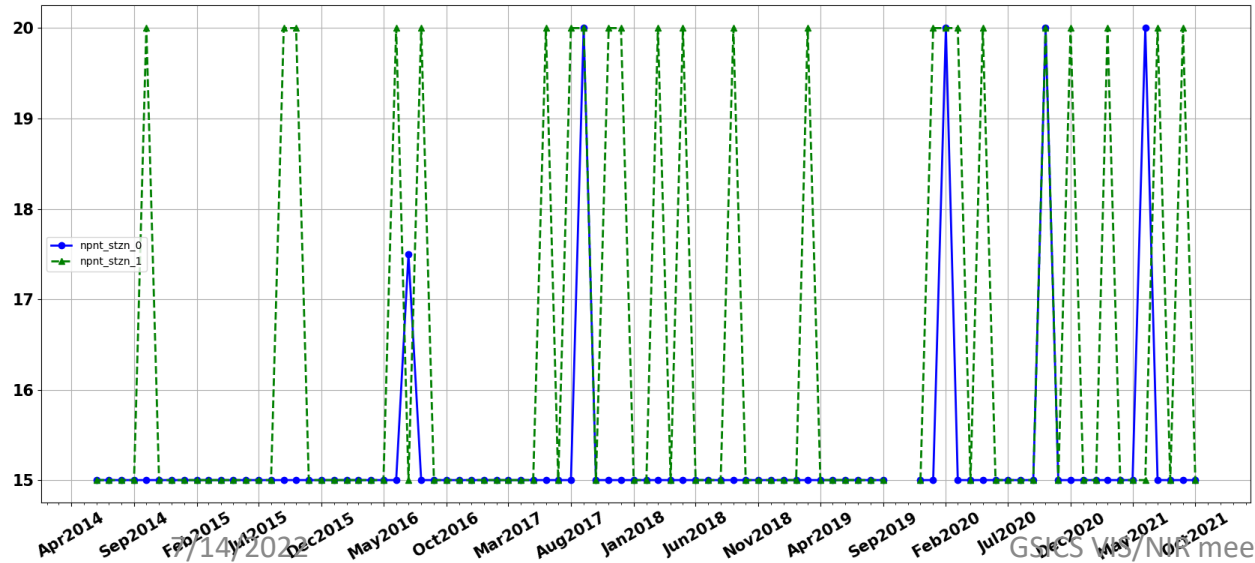
Time difference



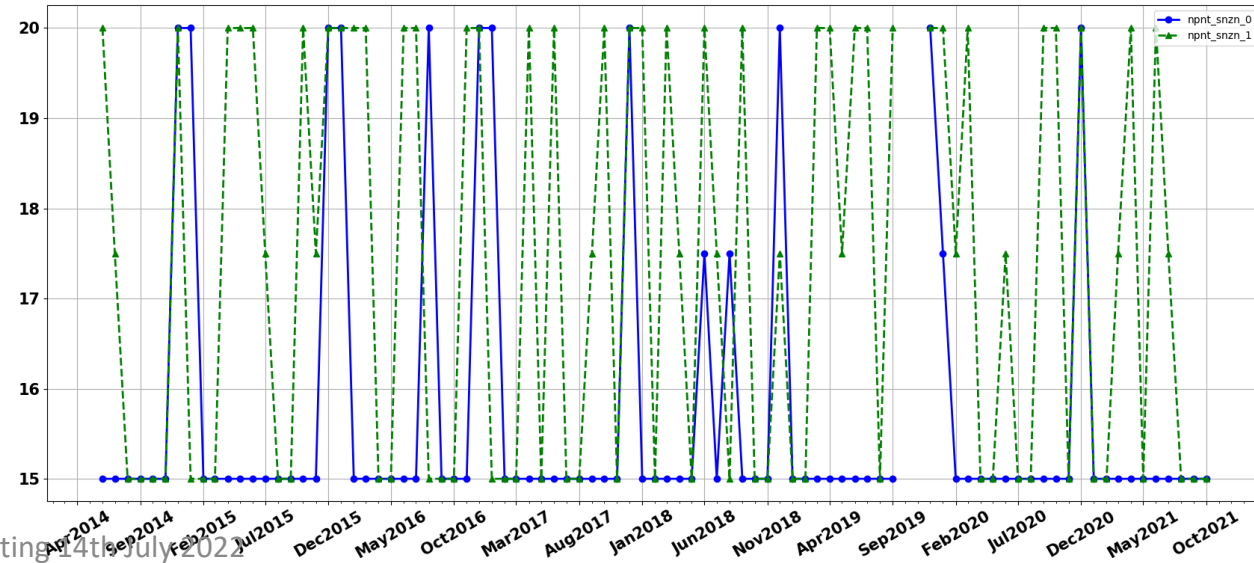
Satellite view angle



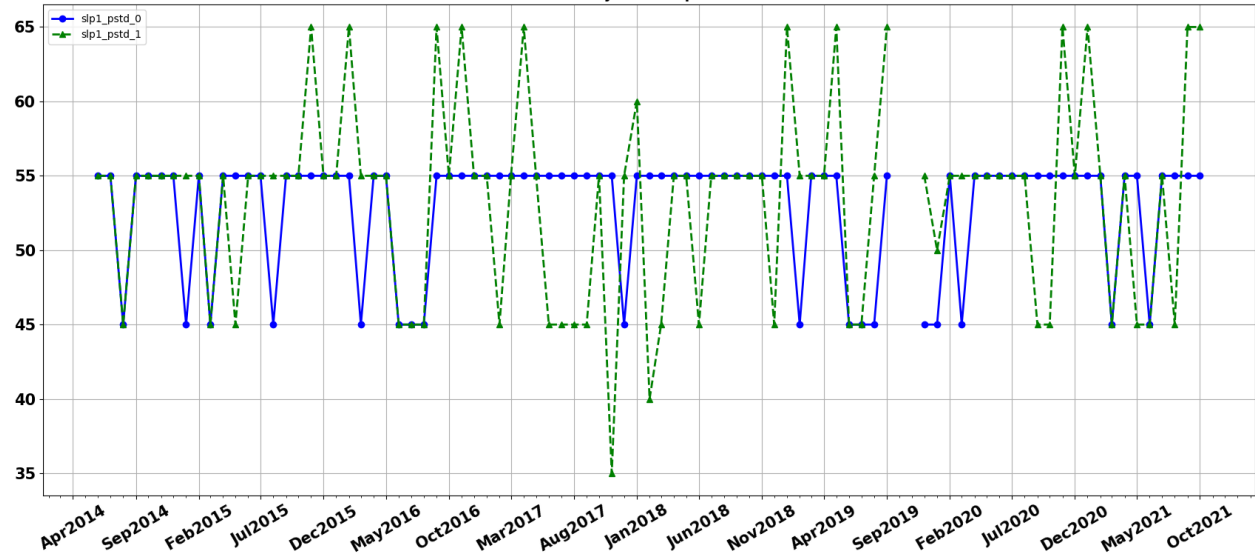
Sun zenith angle



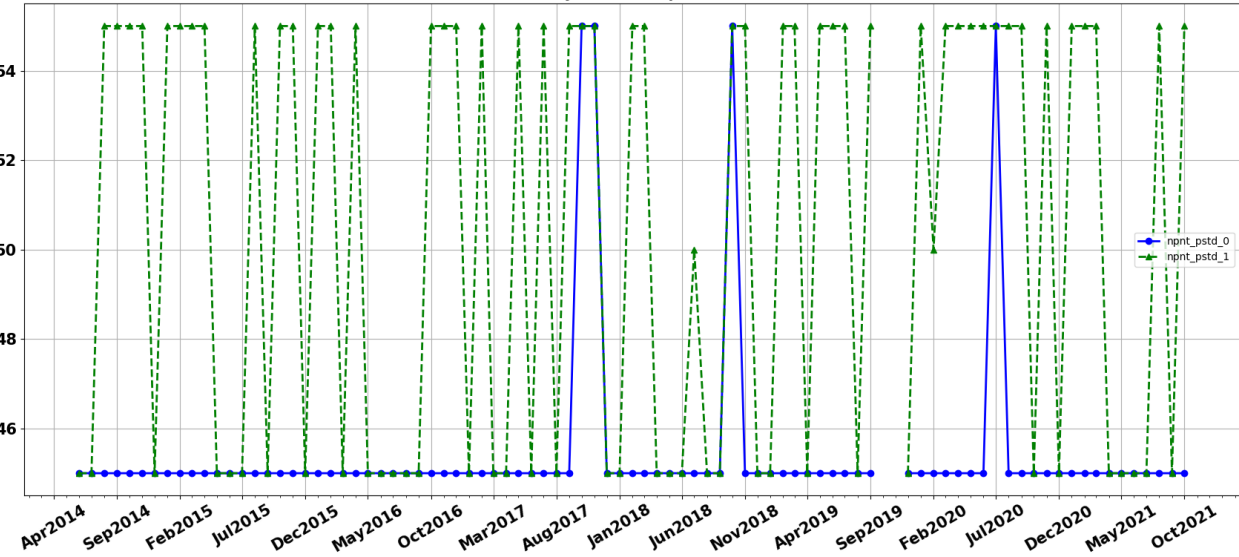
Relative azimuth angle



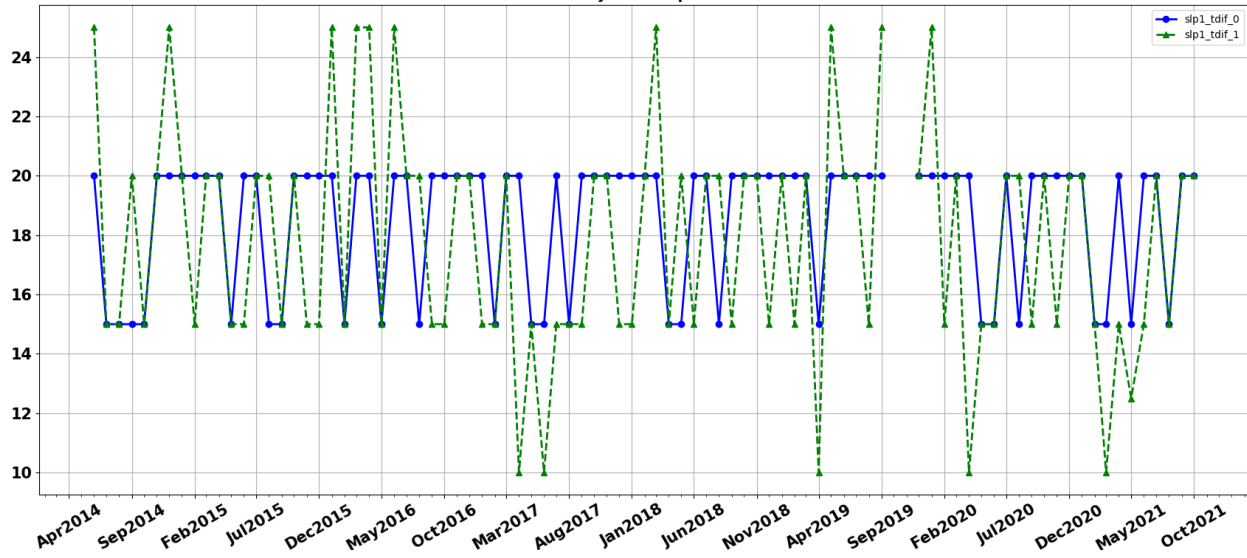
% standard deviation (Slope1)



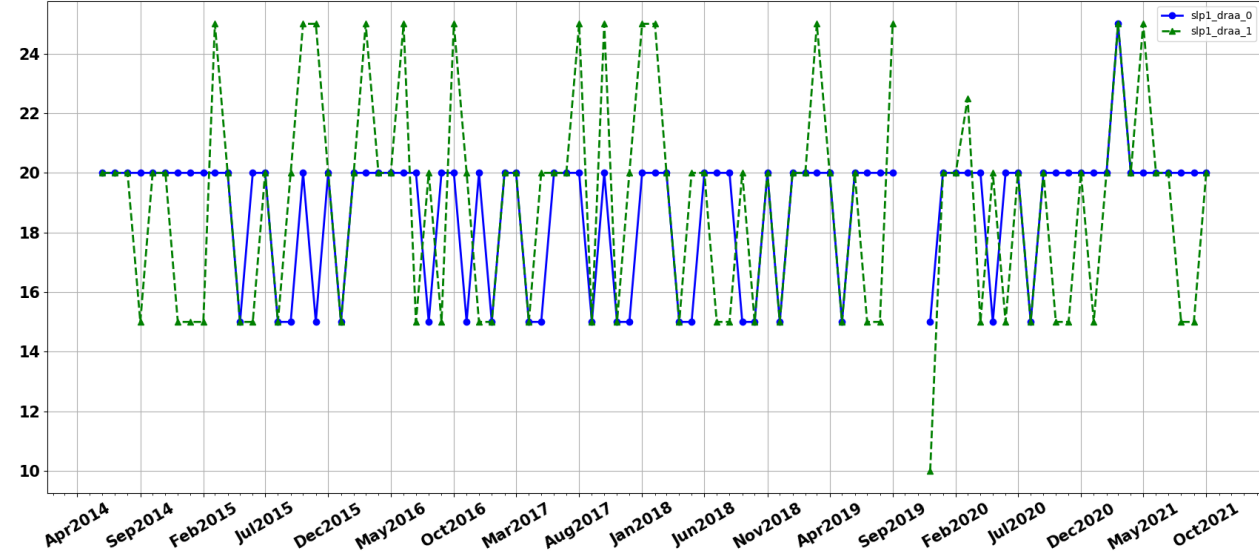
% standard deviation (number of points)



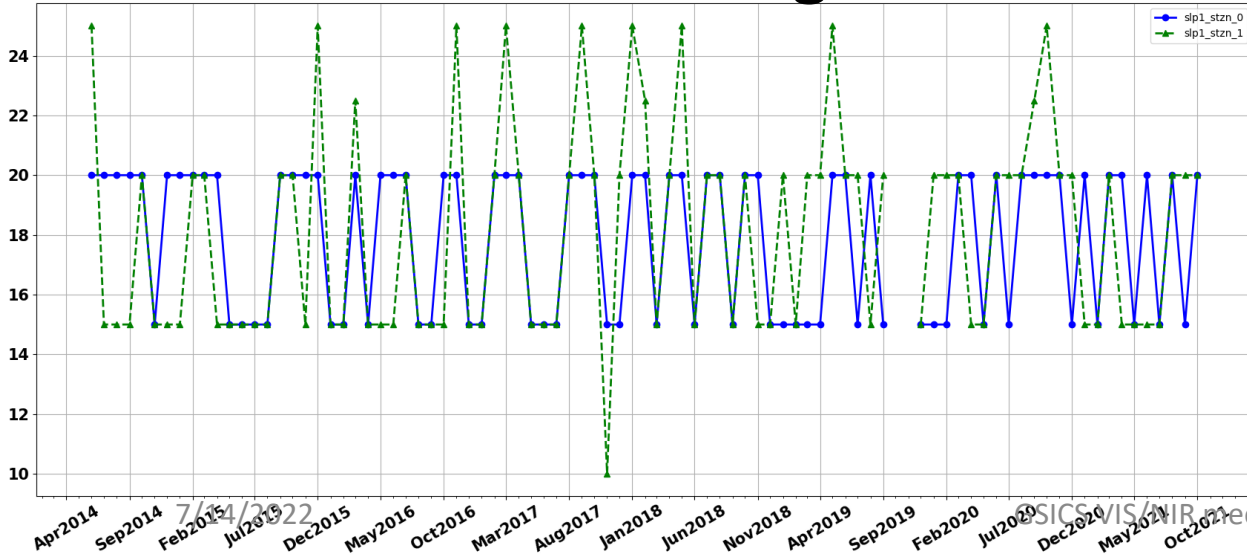
Time difference



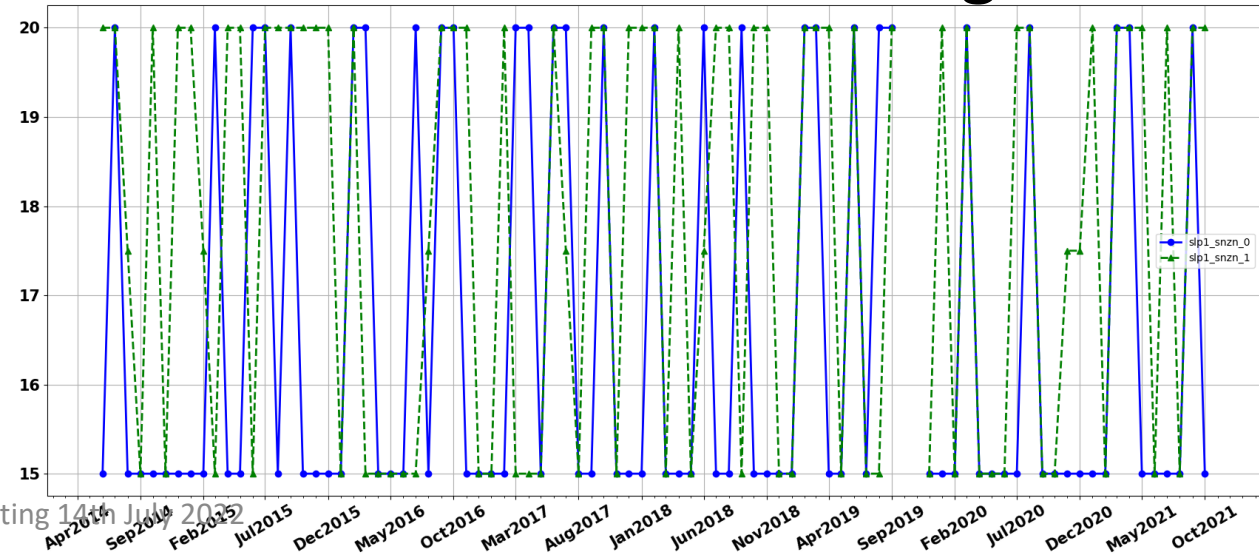
Satellite view angle



Sun zenith angle



Relative azimuth angle



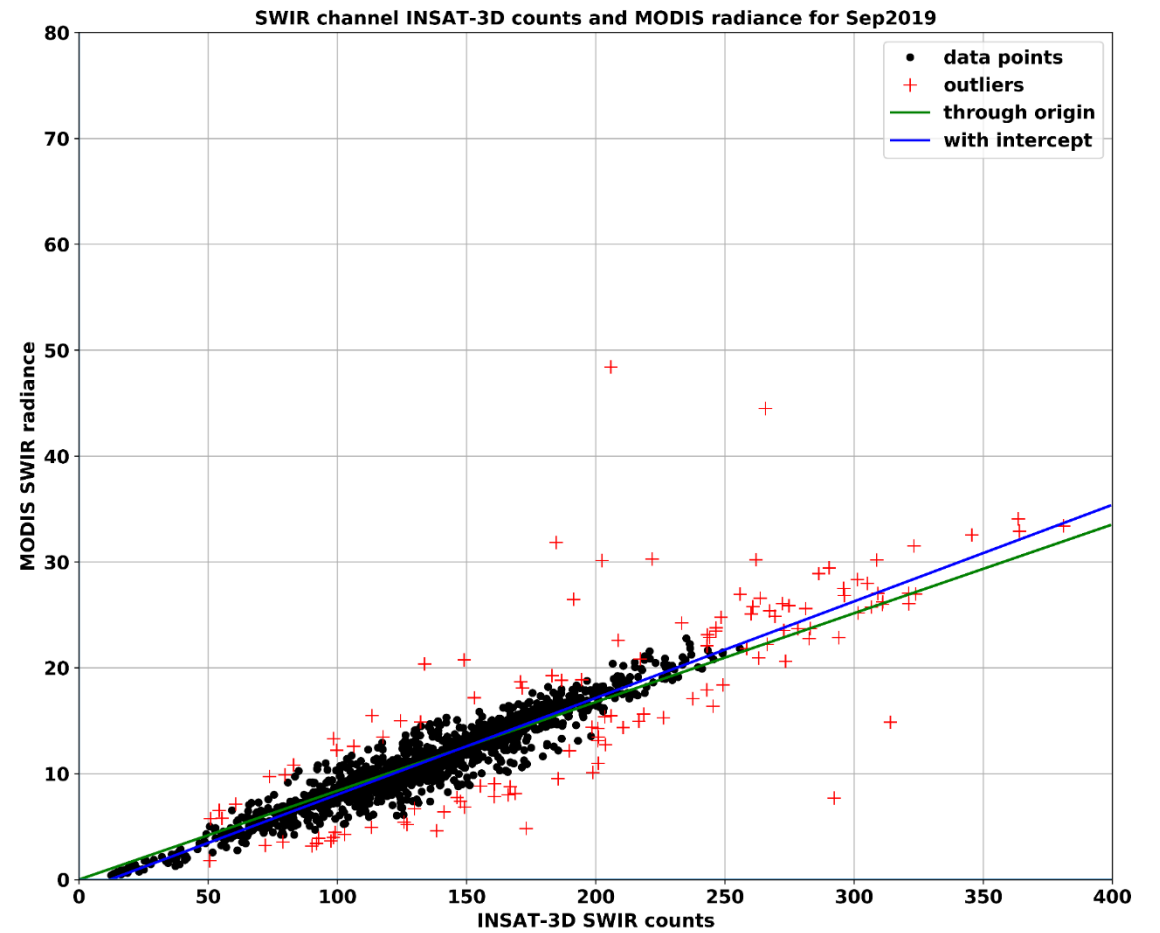
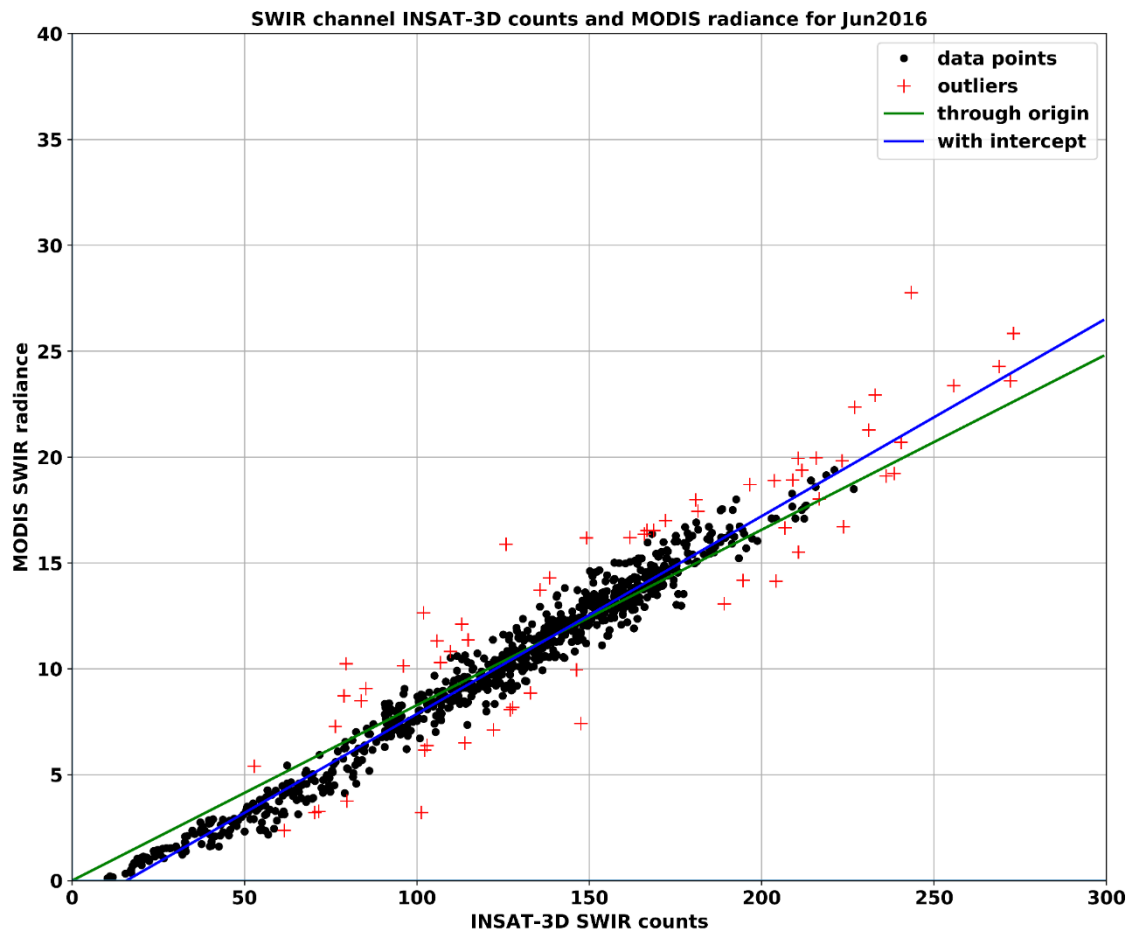
Outlier removal

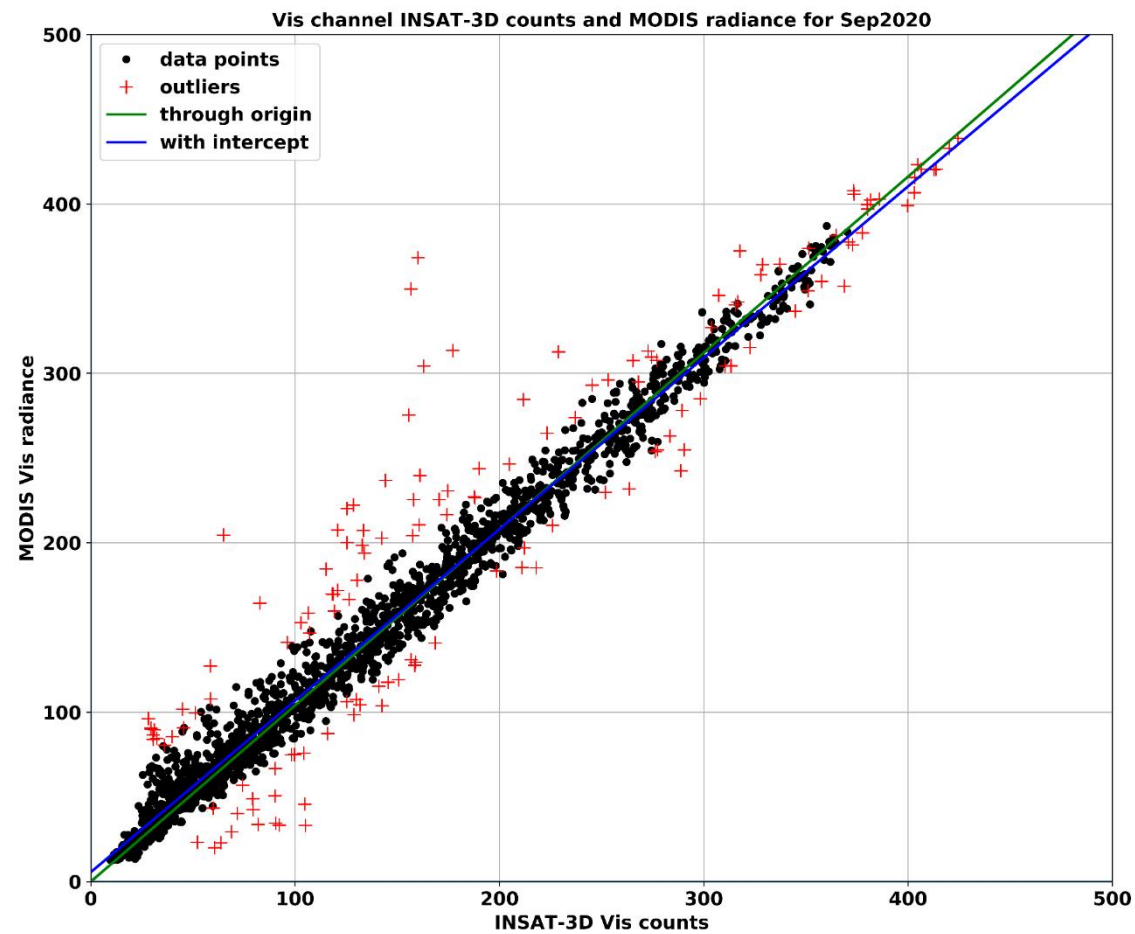
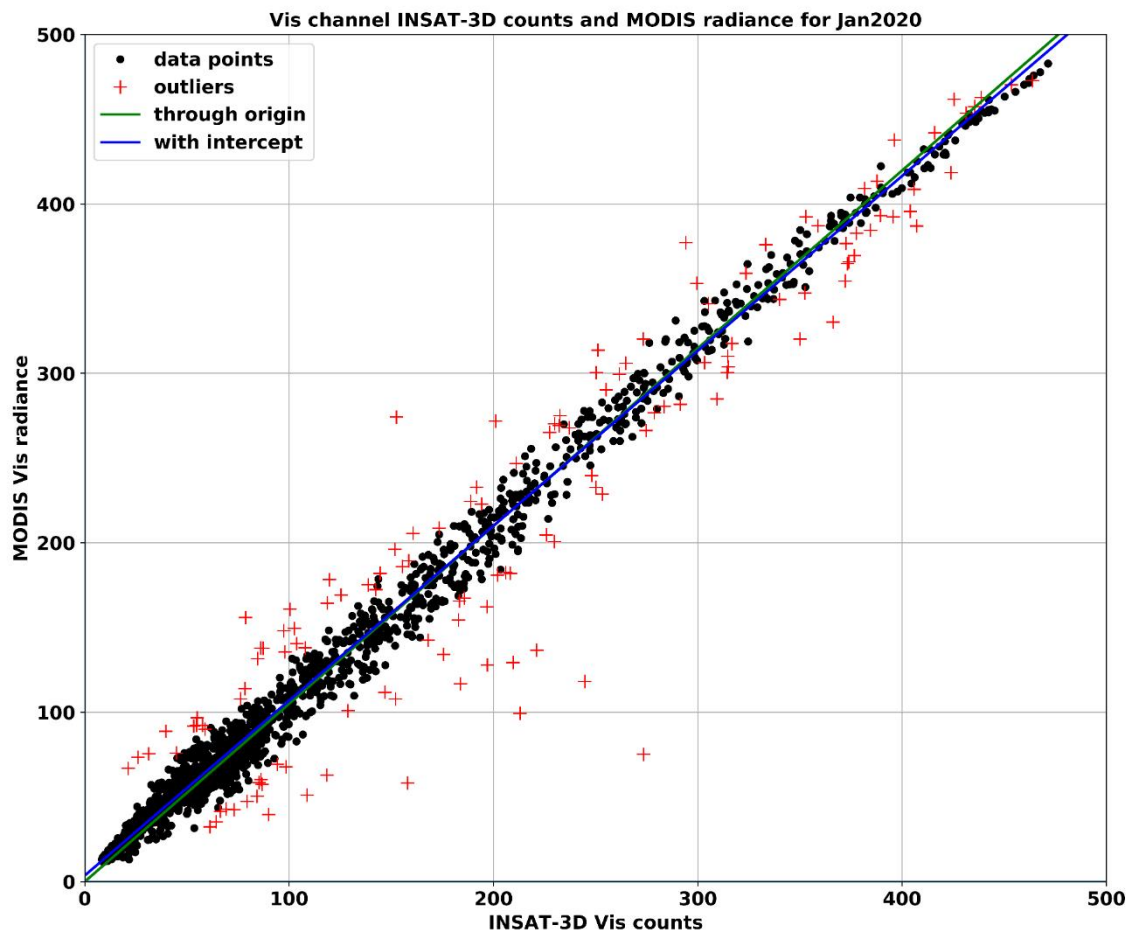
A two-dimensional kernel density estimation is done for count Vs radiance.

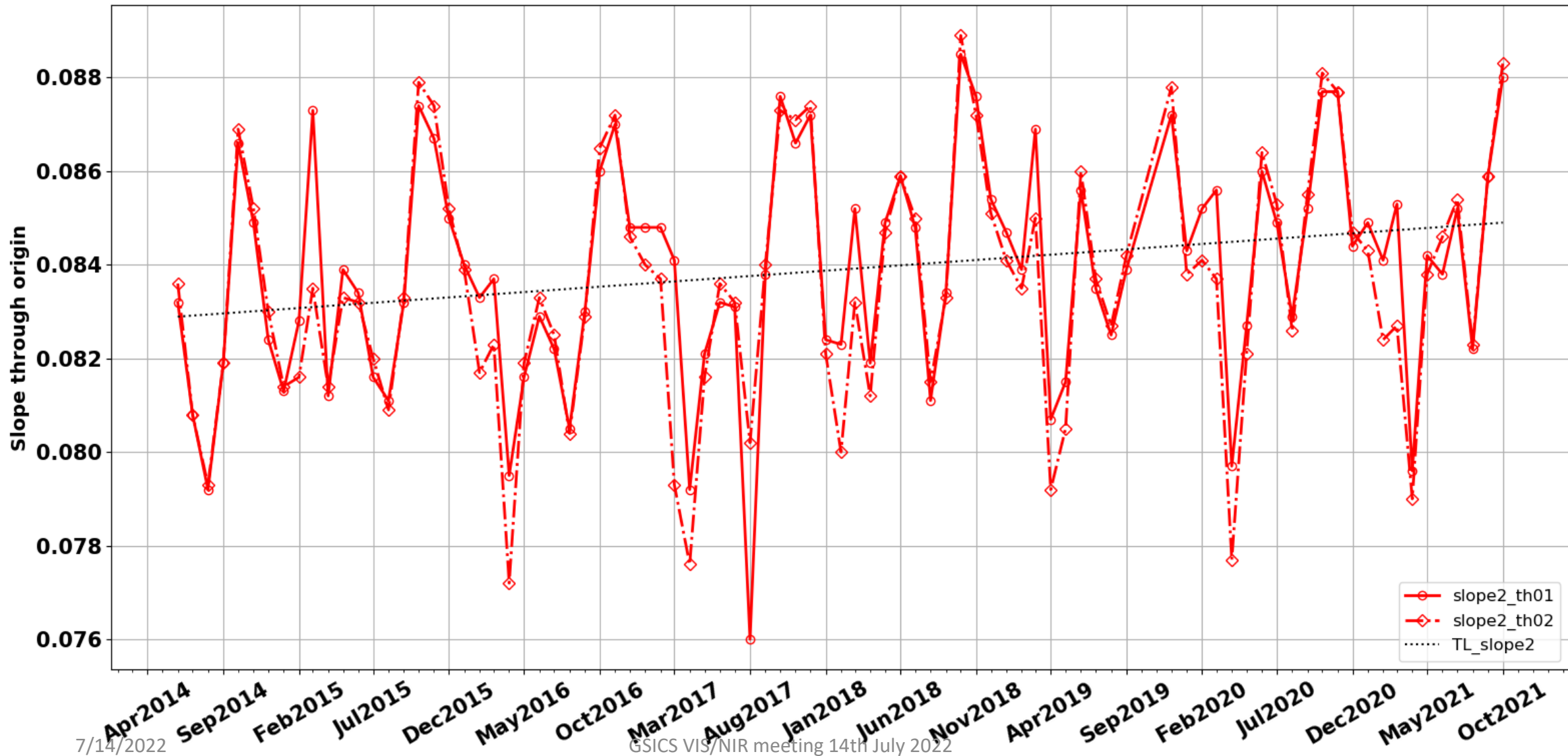
Based on kernel density contours are drawn.

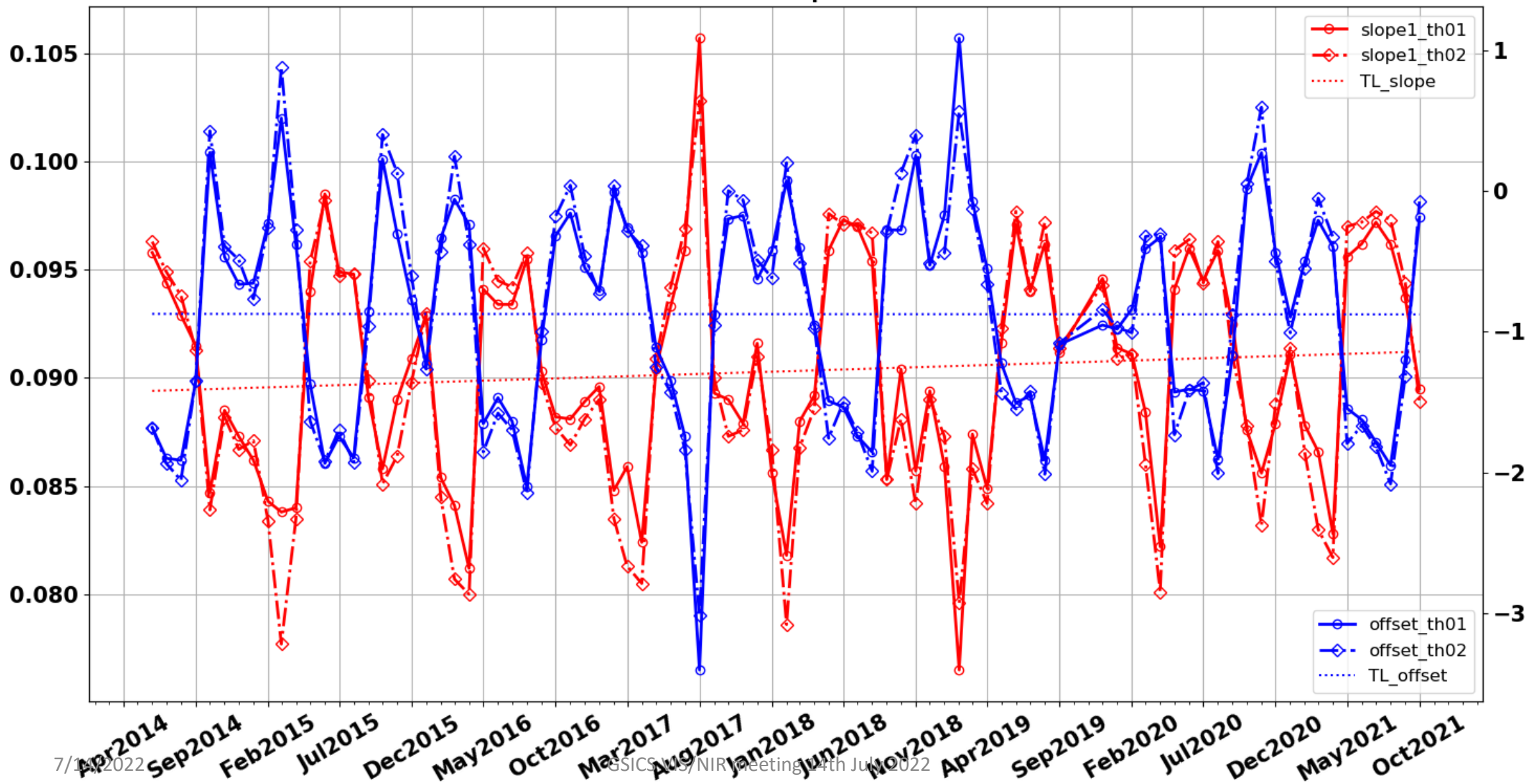
Points lying in outermost contour(s) are rejected.

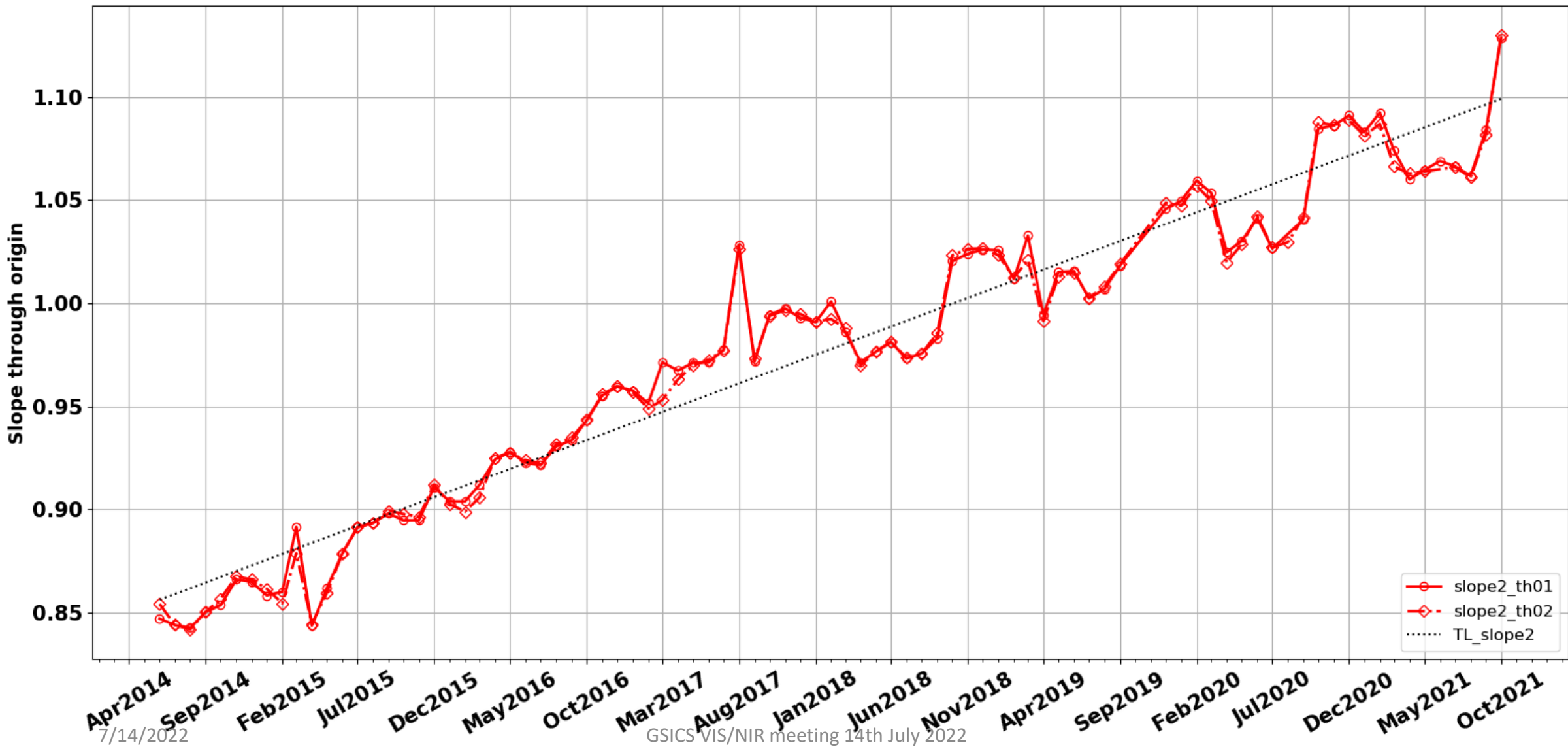
This process is done iteratively (1 to 3 times)











7/14/2022

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