

InSAR Lab Session Notes

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The University of Texas at Austin



GAGE National Science Foundation's
Geodetic Facility for the Advancement of Geoscience

SAGE National Science Foundation's
Seismological Facility for the Advancement of Geoscience

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Digital Elevation Model (DEM)

Download SRTM 1 Arc second (30m resolution)

<https://search.earthdata.nasa.gov/search>



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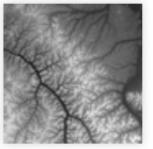


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3 Matching Collections

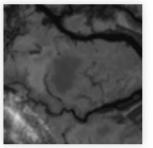
Showing 3 of 3 matching collections

 Export Sort View**NASA Shuttle Radar Topography Mission Global 1 arc second V003**14,297 Granules 2000-02-11 to 2000-02-21 

The Land Processes Distributed Active Archive Center (LP DAAC) is responsible for the archive and distribution of the NASA Making Earth System...

[GEOSS • SRTMGL1 v003 - LP DAAC](#)**NASA Shuttle Radar Topography Mission Global 3 arc second V003**

14,297 Granules 2000-02-11 to 2000-02-21



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[GEOSS • SRTMGL3 v003 - LP DAAC](#)**NASA Shuttle Radar Topography Mission Global 3 arc second sub-sampled V003**

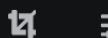
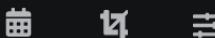
14,280 Granules 2000-02-11 to 2000-02-21



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Search for collections or topics



Spatial Rectangle

SW: 18.73696,-156.31348



NE: 20.39721,-154.58203

Filter Granules

Clear Filters

Granule Search

Granule ID(s)

Search Single or Multiple Granule IDs...

Temporal

Start

YYYY-MM-DD HH:mm:ss

End

YYYY-MM-DD HH:mm:ss

 Recurring?

Data Access

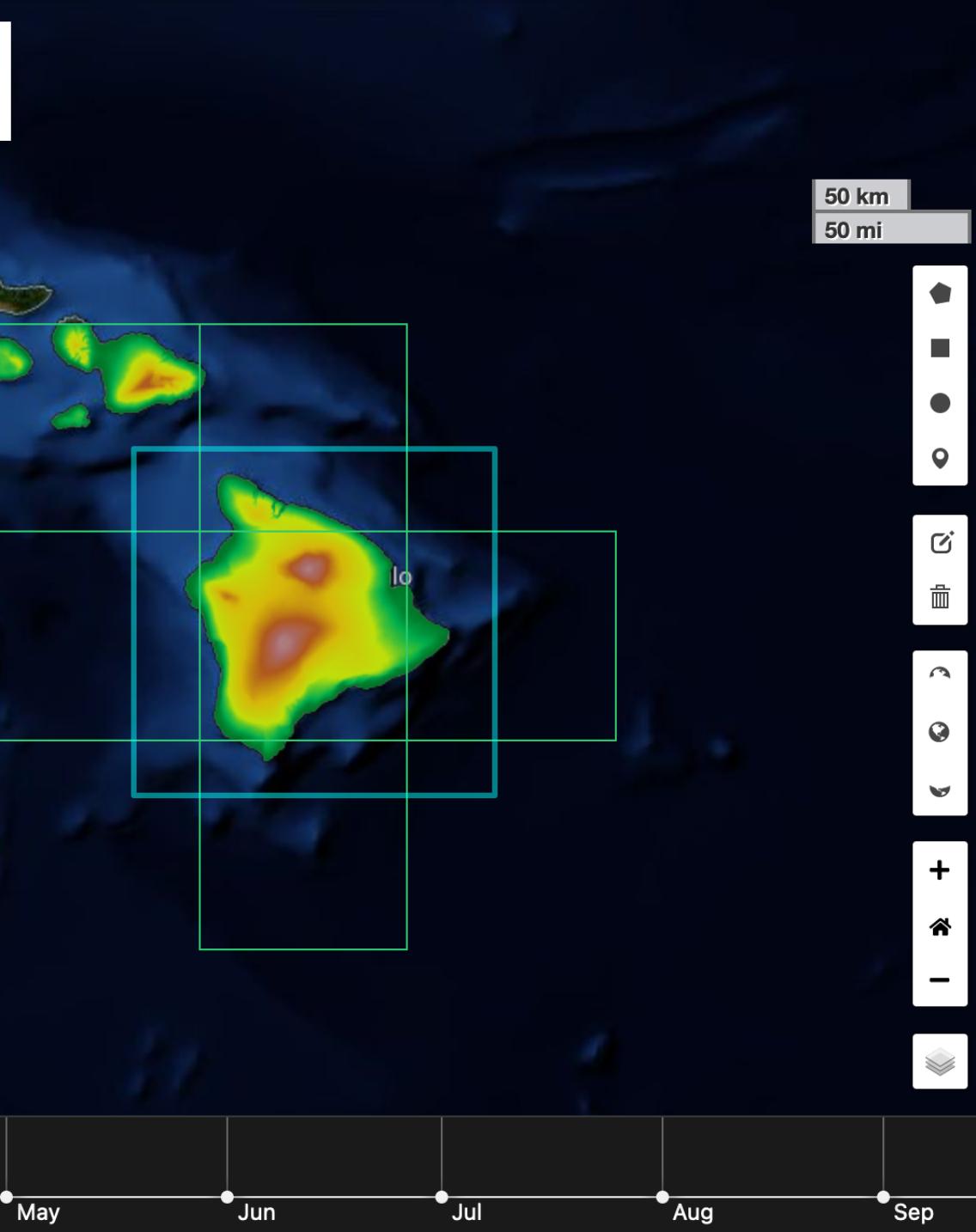
Find only granules that have browse

MONTH
▼

Nov

Search Results (3 Collections)

NASA Shuttle Radar Topography Mission Global 1 arc second V003

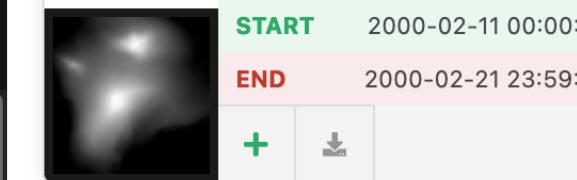


Showing 6 of 6 matching granules

Sort

View

N19W156.SRTMGL1.hgt.zip



START 2000-02-11 00:00:00

END 2000-02-21 23:59:59

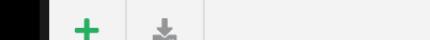
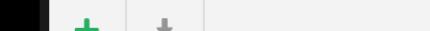


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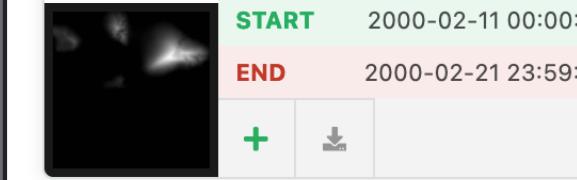


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END 2000-02-21 23:59:59



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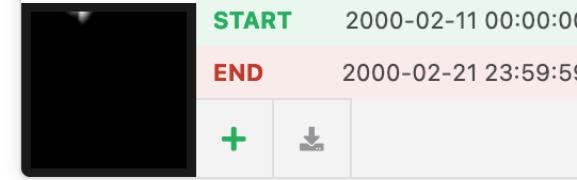


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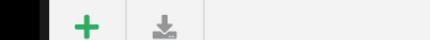
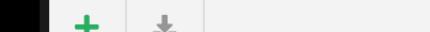


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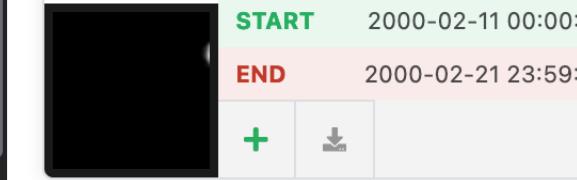


START 2000-02-11 00:00:00

END 2000-02-21 23:59:59



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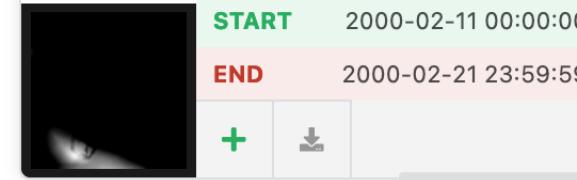


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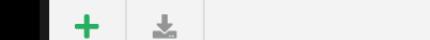
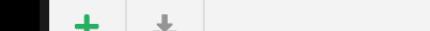


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START 2000-02-11 00:00:00

END 2000-02-21 23:59:59



Search Time: 1.6s

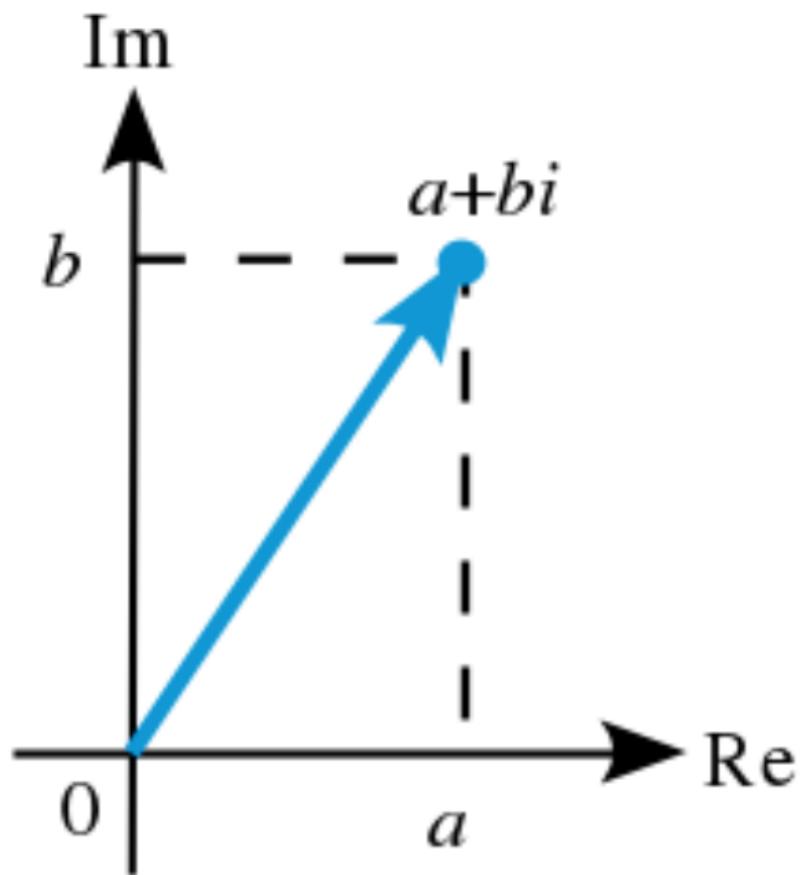
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Complex Numbers

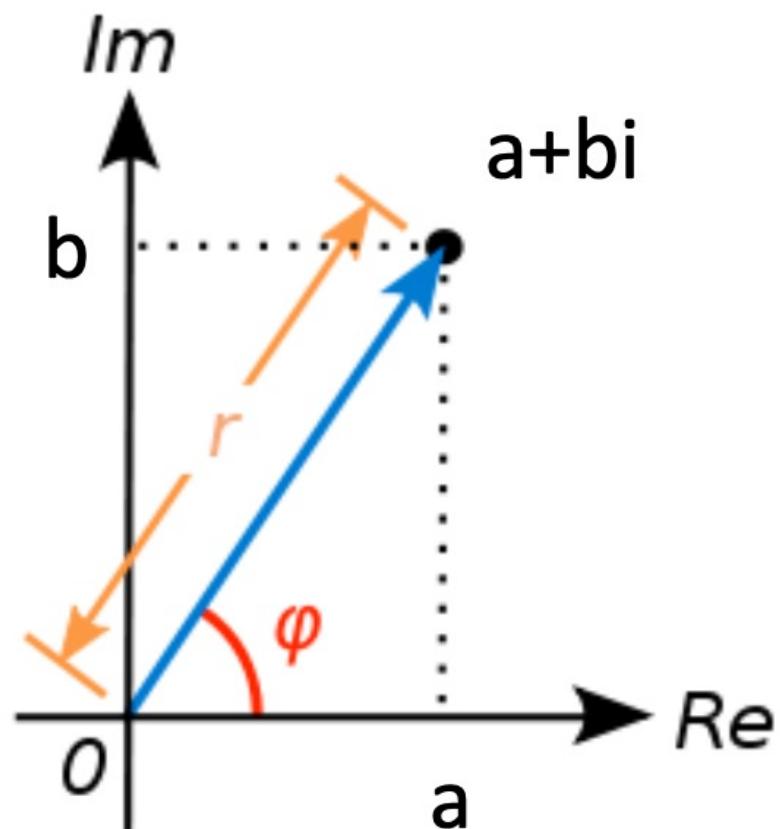
A complex number is a number that can be expressed in the form $a+bi$, where a and b are real numbers and i is defined by $i^2=-1$.



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Complex Numbers



Euler's Formula

$$\begin{aligned} z &= re^{i\varphi} \\ &= r(\cos \varphi + i \sin \varphi) \end{aligned}$$

Amplitude $r = \sqrt{a^2 + b^2} = \text{abs}(z)$

Phase $\varphi = \text{atan2}(b, a) = \text{angle}(z)$

* φ is an angle measured counter-clockwise from the real axis.



Single Look Complex (SLC)

Number of Range
pixels (2^*nr)

Number of Azimuth
pixels (naz)

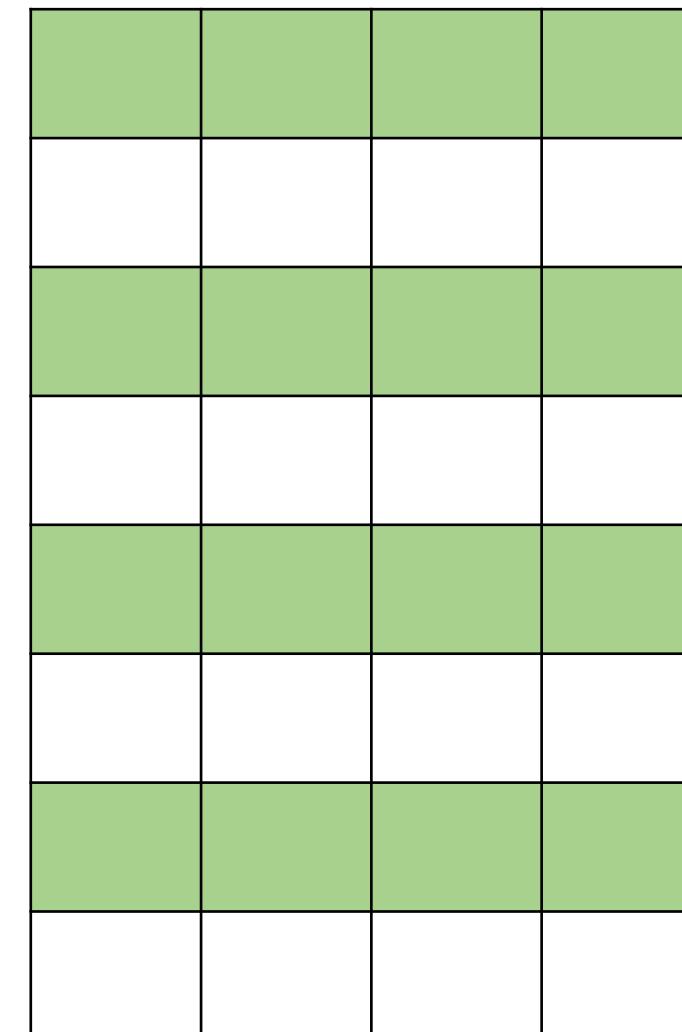


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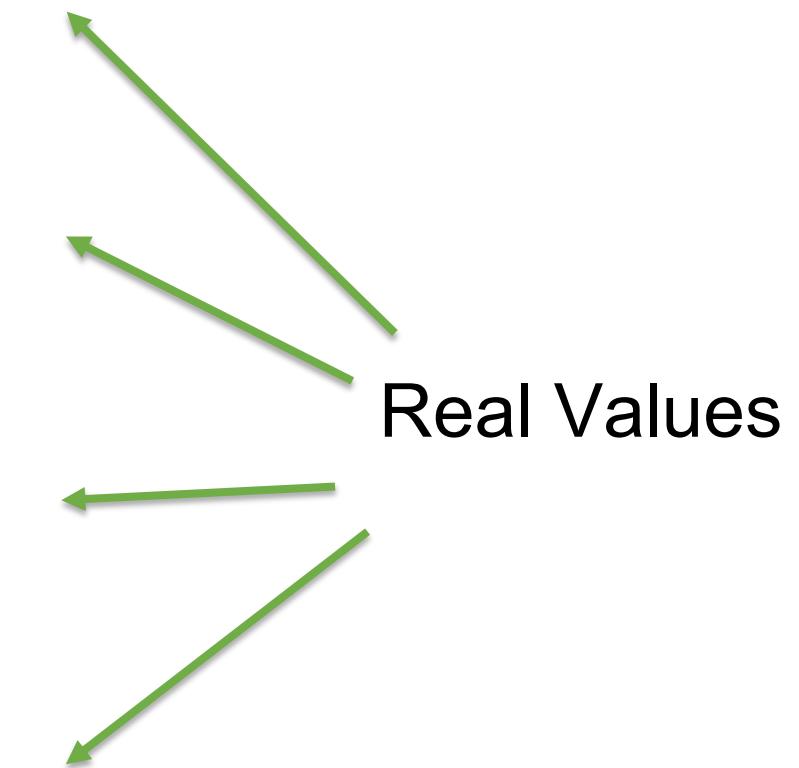
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Single Look Complex (SLC) format for wrapped interferograms

Number of Range
pixels ($2^{*}nr$)



Number of Azimuth
pixels (naz)

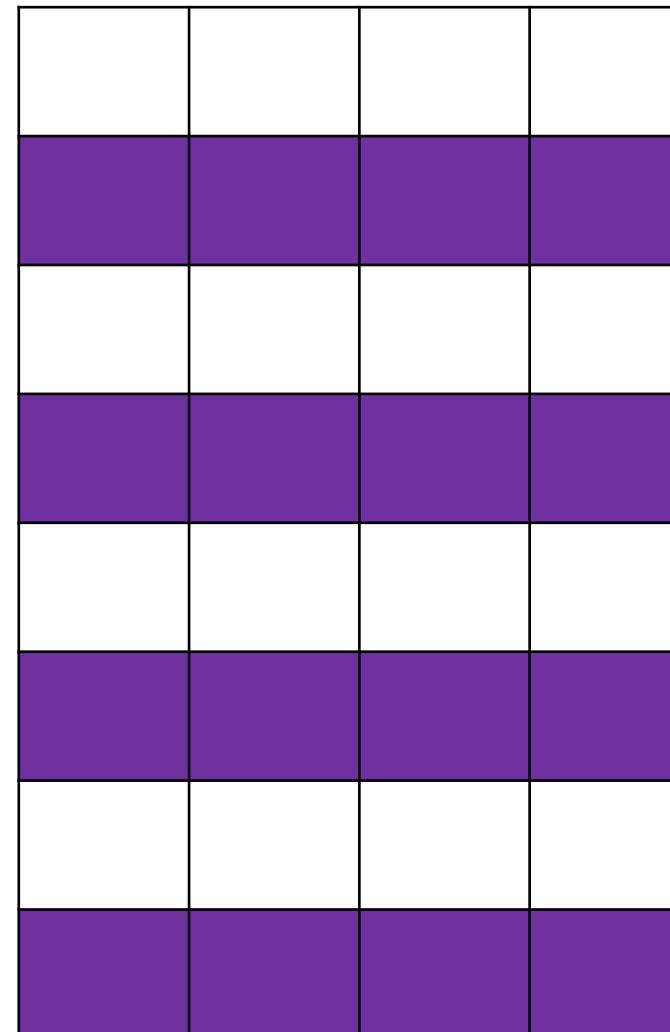


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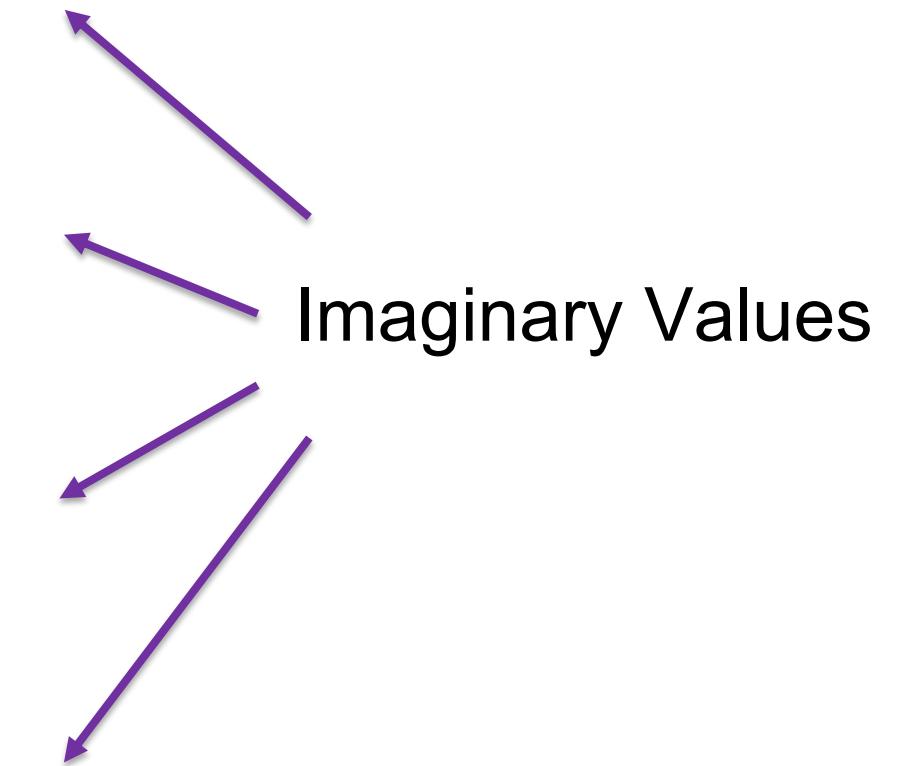
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Single Look Complex (SLC) format for wrapped interferograms

Number of Range
pixels ($2^{*}nr$)



Number of Azimuth
pixels (naz)

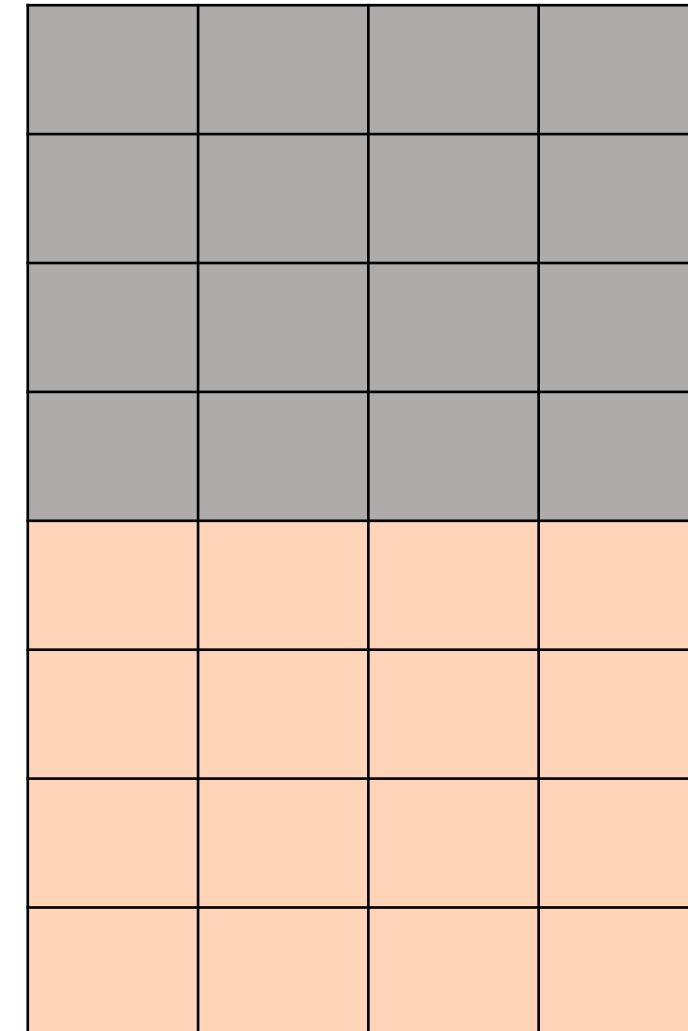


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Unwrapped Interferograms

Number of Range
pixels (2^*nr)



Amplitude

Phase

Number of Azimuth
pixels (naz)



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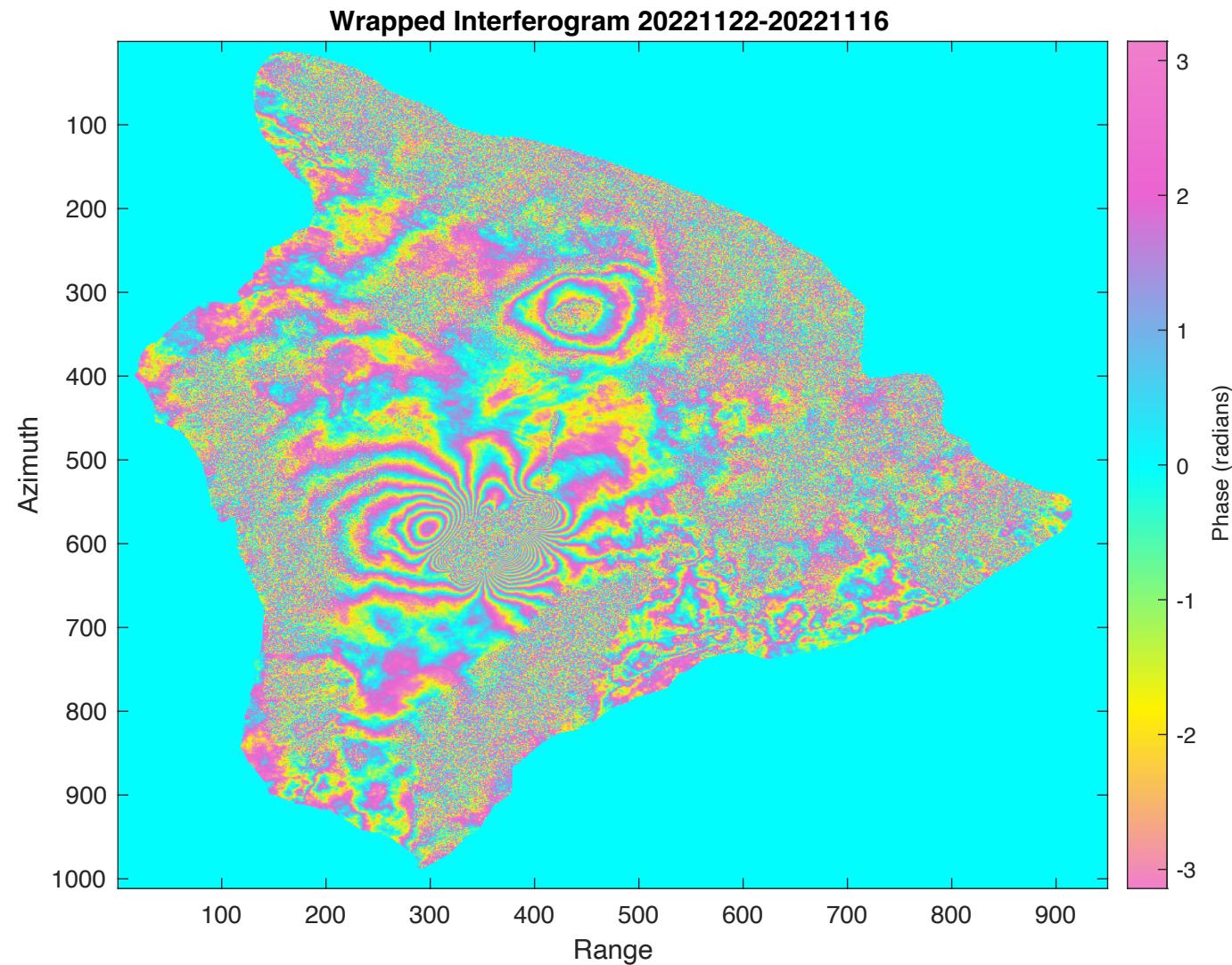
Display Wrapped Interferogram



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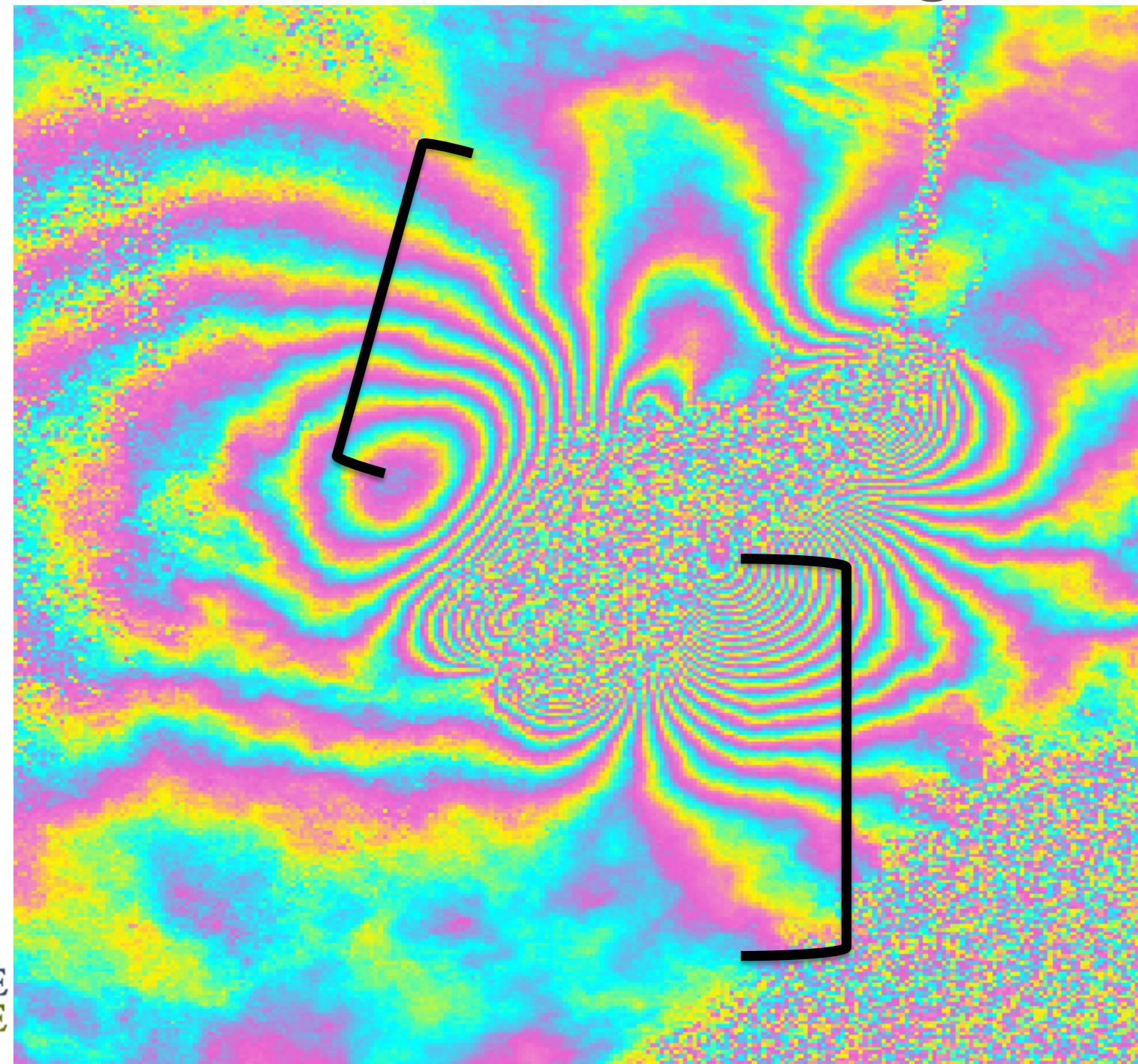
Display Wrapped Interferogram



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Count the Fringes



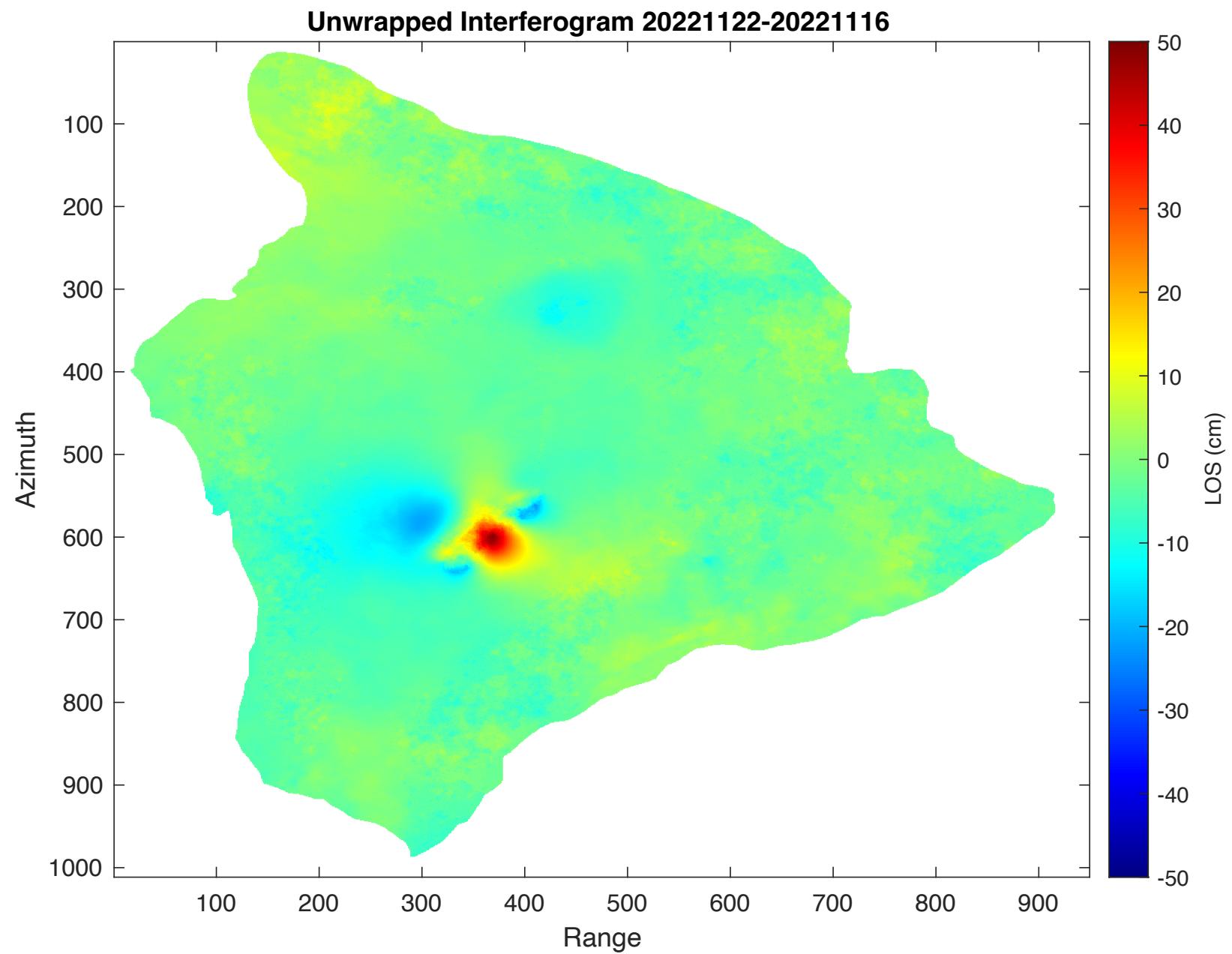
Each fringe cycle
(pink-yellow-blue)
is 2.8cm



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Display Unwrapped Interferogram



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