

# → EARTH OBSERVATION SUMMER SCHOOL

## Earth System Monitoring & Modelling

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## EXPLORATION OF REMOTE SENSING DATA USING SYNTOOL AND SEASCOPE

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# Sentinel-1 A/B wave mode Firework



- <https://drive.google.com/open?id=1sbPd5OYXrCr7xO32gLXXboHb3Ni-MbNF>



- offshore :

[storm waves](#)

[swell front](#)

- Archipelago swell sheltering/refraction/diffraction:

[swell sheltering/refraction/diffraction](#)

- swell current interaction :

[altimeter](#)

[sar](#)

Coast :

[SAR/optical synergy](#)

[optical sun glitter sea-mount refraction](#)

[whitecaps](#)

[cross seas](#)

[cape point diffraction](#)

# Start SEAScope and notebooks



- Go to directory C:\OVL\seascope
- Click on SEAScope.bat to open SEAScope, it may take some time as an index is build during the first opening (it should already have been opened once for testing before)



# Start SEAScope and notebooks



- Go to directory C:\OVL\seascope
- Download following notebooks and python modules :

[S2\\_swell.ipynb](#)

[SWELL\\_refrac.ipynb](#)

[seascope\\_export.py](#)

[seascope\\_import.py](#)

Move them into C:\OVL\seascope\notebooks



- Click on SEAScope.bat to open SEAScope
- Click on JupyterLab to open the Jupyter interface in a browser
- seascope-processor is not used today but may be useful to make transects and save extracted outputs

# Interact with SEAScope using notebooks



In this session, we are going to derive Swell from Sentinel-2 data.

Data are extracted from SEAScope.

Go to the browser where jupyter has opened :

- Open the S2\_swell.ipynb notebook and follow the instructions in the notebook:
- Select the Select the Sentinel 2 Red and blue Channels (or the RGB) collection at a resolution high enough to see the waves in SEAScope
- Use *Middle button* to draw a polygon to extract data and *shift enter* to close the polygon, click on the extract button. Extracted granules are shown at the top of the collection panel.
- Run cells in the notebooks to compute Cross spectra and compare the phase to the linear dispersion relation.



# Interact with SEAScope using notebooks



In this session, we are going to derive the swell refraction due to current.

Data are extracted from SEAScope and results are exported back to SEAScope for easy comparison

Go to the browser where jupyter has opened :

- Open the SWELL\_refrac.ipynb notebook and follow the instructions in the notebook:
- Select the surface velocity from the GlobCurrent total surface raster collection in SEAScope
- Use *Middle button* to draw a polygon to extract data and *shift enter* to close the polygon, click on the extract button. Extracted granules are shown at the top of the collection panel.
- Run cells in the notebooks to import velocity, compute trajectory of fictive swell rays, play with the number of rays and steps, export wave rays into SEAScope
- Go back to SEAScope and compare the wave rays with the current from GlobCurrent.

# Download seascope for windows



- Download all seascope\_bundle.7z.00\* archives as well as the seascope\_bundle.exe from the ftp:
- execute seascope\_bundle.exe, and click on extract on the pop up window. It will extract all files from all seascope\_bundle archives into a seascope directory.
- Unzip it, it will create a seascope
- In your seascope directory:
  - put your notebooks into the notebooks directory
  - Data are in the data directory
- Before launching SEAScope.bat (or SEAScope) for the first time, check that there is no config.ini file nor index.fb in the seascope directory. Launch SEAScope, it will build the config.ini using the location of the seascope directory, and build the index.fb using data from the data directory. Opening SEAScope for the first time may take some time as the index is build.
- A user manual is available at [seascope.oceandatalab.com](https://seascope.oceandatalab.com)

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# Download seascope for Linux



- Copy the seascope\data directory from the computer to get the data
- All the installation procedure is available at [seascope.oceandatalab.com/docs/seascope\\_install\\_manual\\_2017-09-08.pdf](https://seascope.oceandatalab.com/docs/seascope_install_manual_2017-09-08.pdf)
- Download SEAScope from [seascope.oceandatalab.com](https://seascope.oceandatalab.com) and extract it following the installation procedure in the [seascope\\_install\\_manual](#) document
- Copy the directory that contains data into the seascope directory
- Launch SEAScope, it will build the config.ini using the location of the seascope directory, and build the index.fb using data from the data directory. Opening SEAScope for the first time may take some time as the index is build.
- If you want to interact with the interface using python: Install the python SEAScope package by following the instruction in the [seascope\\_install\\_manual](#) document.
- Installation and User manuals are available at [seascope.oceandatalab.com](https://seascope.oceandatalab.com)

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