

## ***Near coast Bathymetry based on wave characteristics - Inverse methods***

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The computations of directional wave spectra by a fast Fourier transform (FFT) from the synthetic aperture radar (SAR) images have been used to retrieve the wavelength and wave direction, as well as to estimate the water depth by solving the linear dispersion relation. The methodology calculates the 2D image spectrum in a cell of the image. The computation progress from open sea to shoreline in cells, which are either centered at fixed grid points or along a wave ray, which allows tracking of the change in the wave length and wave direction as waves progress to the shore.

In this presentation, we will show the application of Sentinel-1A with C-band SAR images to retrieve the bathymetry of the Aveiro (north-western Portugal) study site. The repeatability of the FFT methodology in retrieving the nearshore bathymetry is analysed, considering a set of four high temporal resolution images and evaluating the sensitivity of the results to internal factors related to the estimation of the wave length, either offshore or local. Their results show that a combined solution that merges the results of all the image set slightly improves the results. It will also show that the relative error of the water depth ranges between 6% and 10% for water depths between 15 and 30 m.