

Exercise 2 – Processing and analysis of passive acoustic data

Abstract:

A 10 s long passive acoustic recording from the Fram Strait (UNDER-ICE project) is provided. Use Audacity to visualize and process the data.

Tasks:

Load the data into Audacity and look at the recording in the time domain. Can you, based on the waveform, tell what's going on?

Compute a frequency spectrum of the entire recording. What frequencies are present? Compute the spectrum from 2 to 4 seconds. What frequencies are dominating the spectrum?

Compute a spectrogram of the entire recording. How does this compare to the spectrogram? Is there additional information here compared to the frequency spectrum?

What types of signals do you see in the spectrogram?

Apply a low-pass filter with a cut-off frequency of 6 kHz. What happens, and what do you hear?

Apply a high-pass filter with a cut-off frequency of 6 kHz. What happens, and what do you hear?

Apply a notch filter at 9 kHz. Does this eliminate the 9 kHz signal completely?

Exercise 3 - Metadata

Abstract:

Arnie the Acoustician went on a field trip as a part of the CHOPPA project and made passive acoustic measurements in the harbor of Longyearbyen. The measurements were made for 2 hours starting on the 30th of November at 1400 (UTC + 1), with an Olympus V301 transducer with a sensitivity of -160 dB re 1 μ Pa/Volt and flat frequency response. The depth of the hydrophone varied from 25 m to 30 m.

Arnie works at the GET-TO institute and can be contacted via email: arnie@get-to.au

Tasks:

Imagine that you will write a paper about the recordings made by Arnie. What kind of information is needed to make proper use of the data?

Help Arnie to fill out the relevant metadata information and create a NetCDF file for publication. Use the provided MATLAB script.