ACE Wave Data

Data Jam Days
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ACE

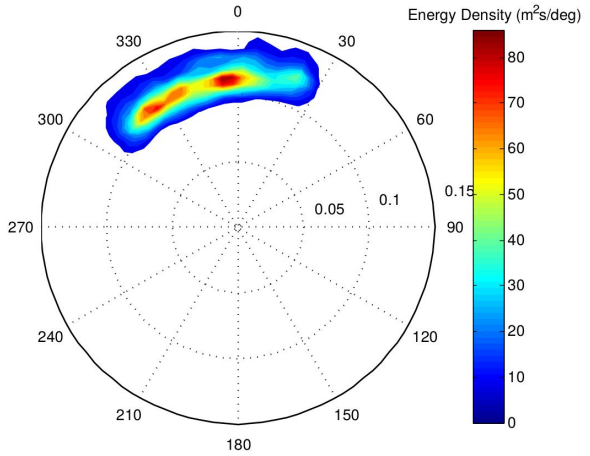
The Akademik Tryoshnikov sailed the Southern Ocean, during the cruise wave properties were monitored with the WaMoS wave radar and the ship motion recorded with the onboard GPS/IMU

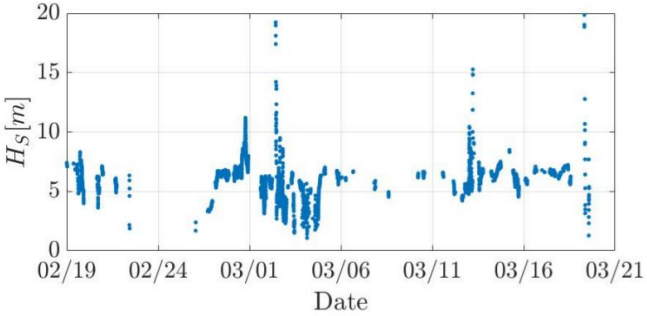
The data challenge

The WaMoS radar was not active for the entire duration of the cruise.

The WaMoS radar does not provide the wave properties in ice infested seas (close to the Antarctic Continent).

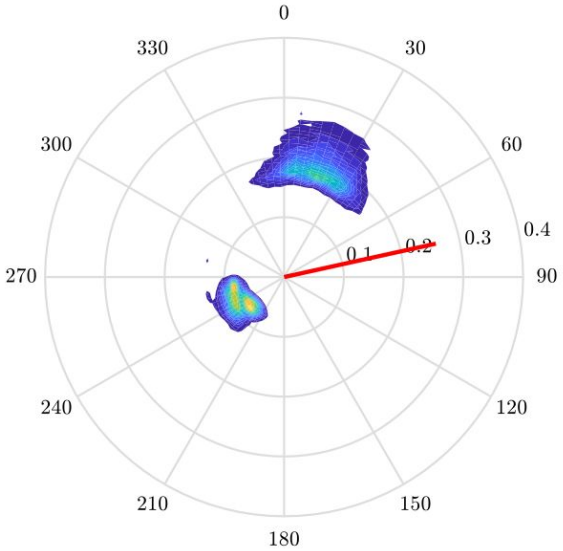
CAN WE INFER THE WAVE PROPERTIES FROM THE MOTION OF THE SHIP?

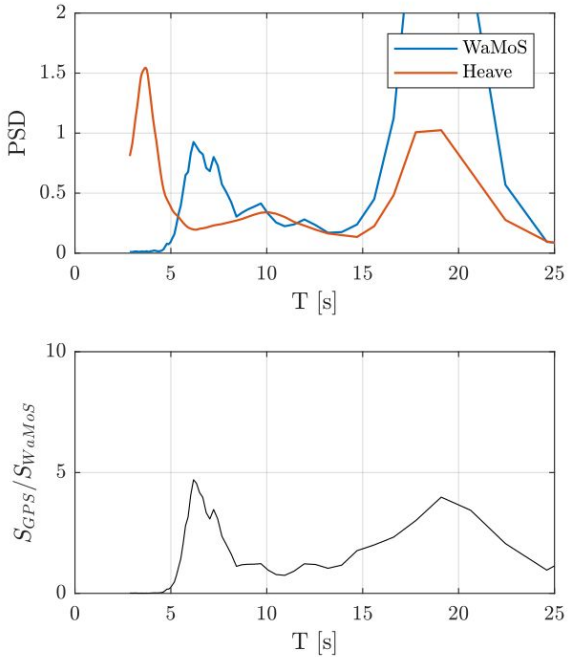




What we did

The Wamos radar, corrected for the doppler effect has been integrated over the direction and compared to the heave (up-down) movement spectrum to derive a transfer function.

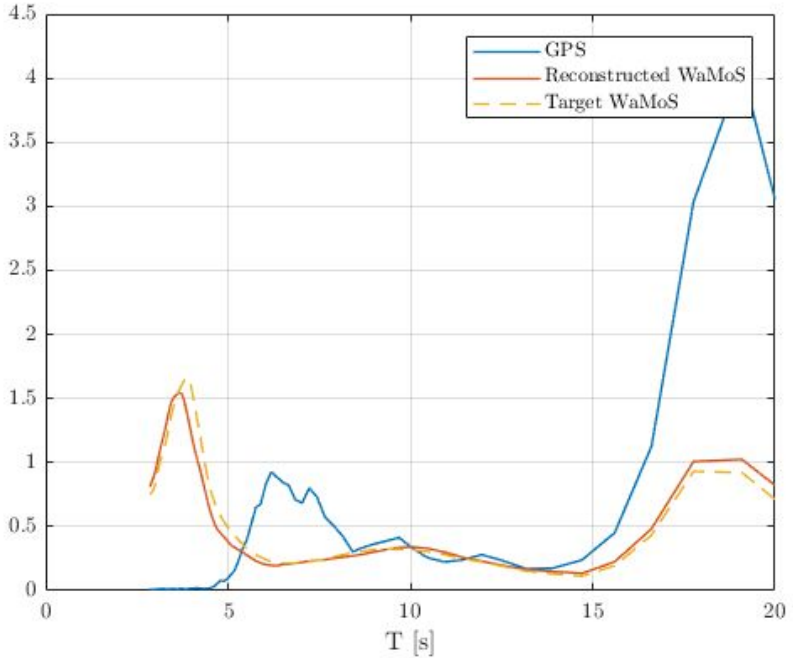




Testing/1

For conditions similar to the one of the calibration the reconstruction works well

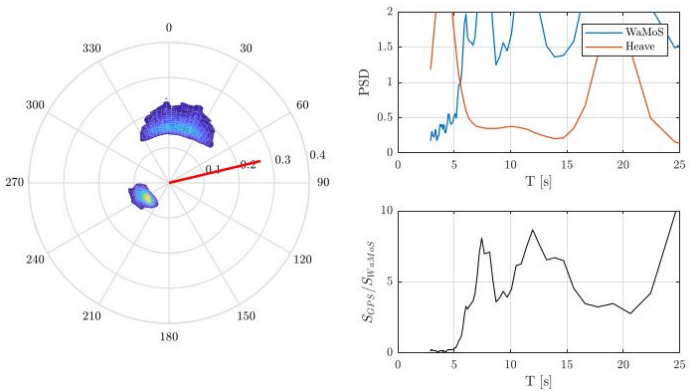
.... but ...

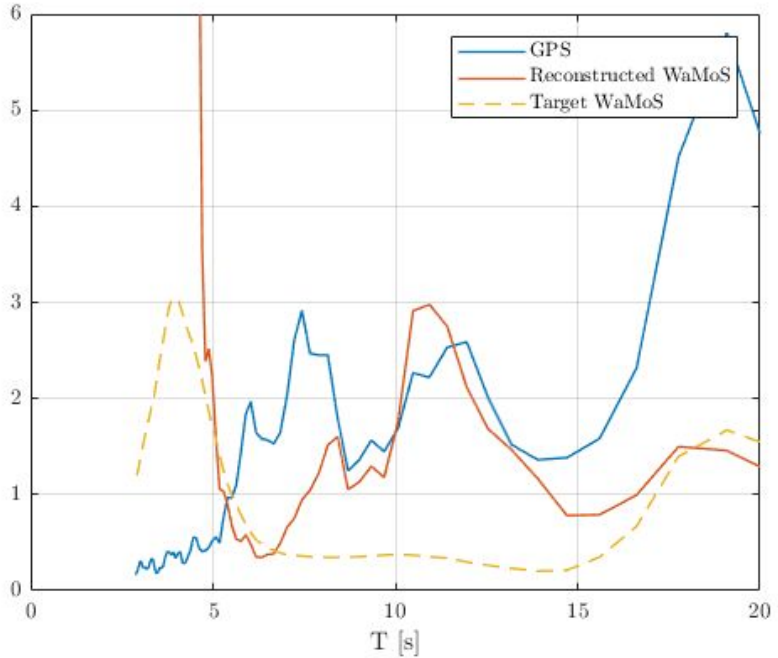


Testing/2

… we are not always that lucky

If conditions change slightly the transfer function does not work well





Open challenges

Obtain a transfer function (or a series of transfer functions) that performs better in a wide range of metocean conditions.

1. **Incorporate information from the pitch, roll, yaw etc. to improve the physics**

2. **Or work on machine learning by using the wide range of recorded conditions to identify a transfer function**