

Wind-Waves: challenges & opportunities with SWOT

a preamble

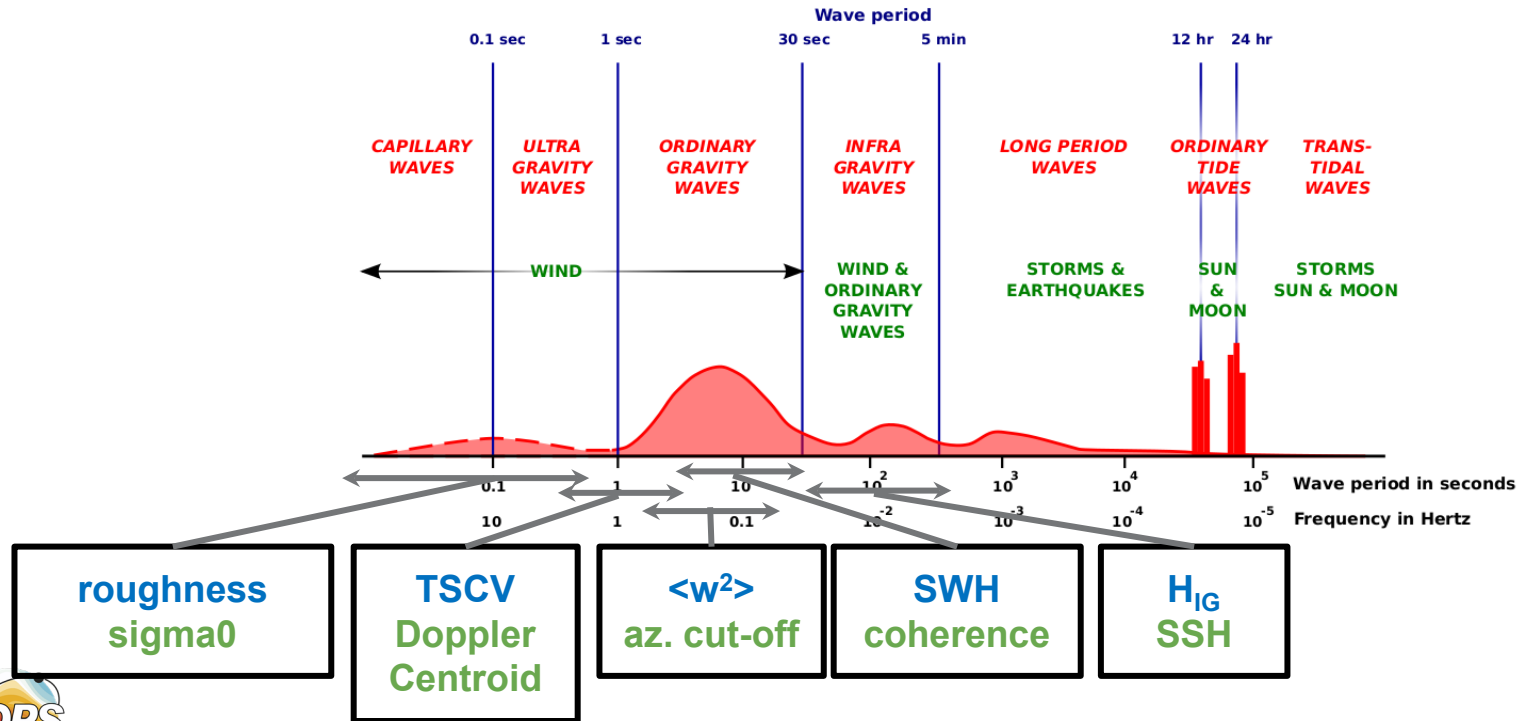
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Wind waves: variance of surface elevation and other quantities

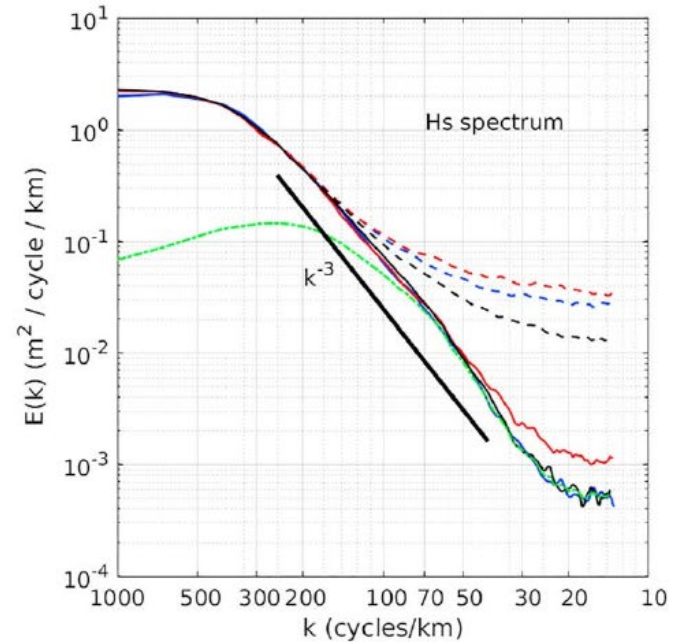
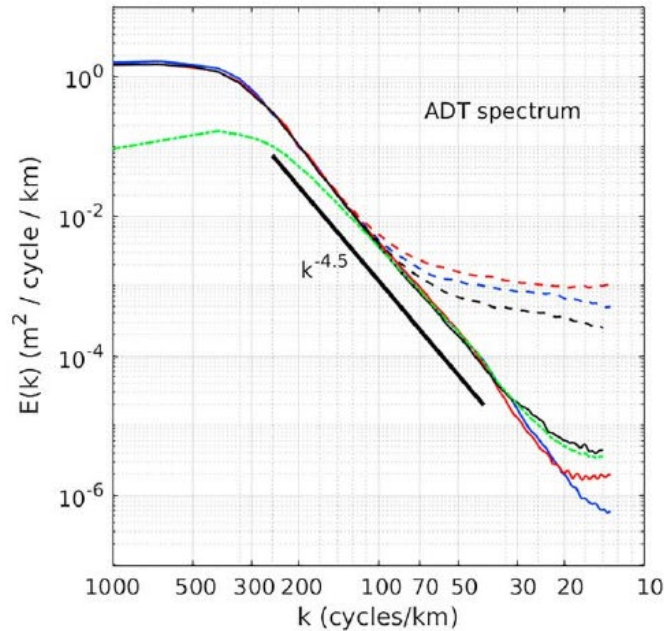
“Wind waves” are generated by the wind... what else makes them special?

- these are part of the family of **surface gravity waves**



Wind waves: spatial variability of envelope

Instead of the spectrum of elevation ζ , we can look at the spectrum of $|\zeta|$ (or the spectrum of SWH... similar)

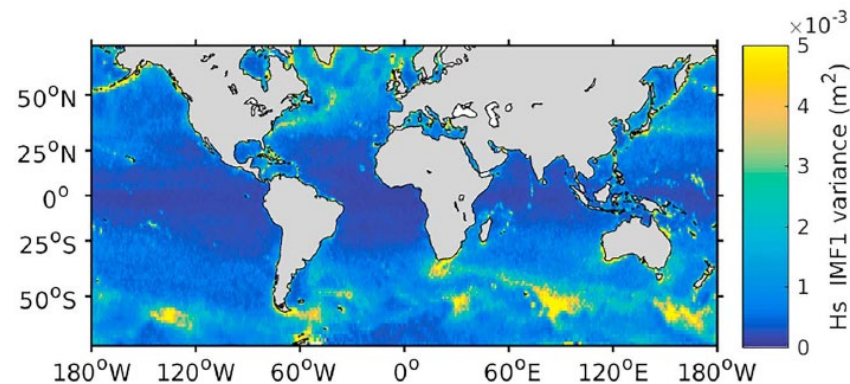
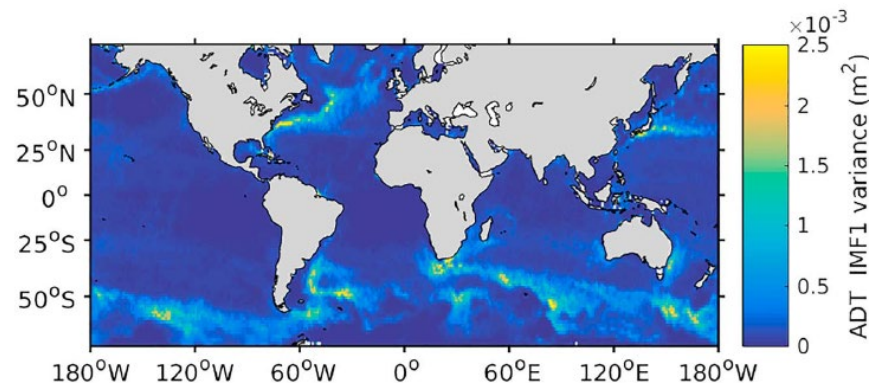


Quilfen & Chapron (GRL 2019)



Wind waves: spatial variability of envelope

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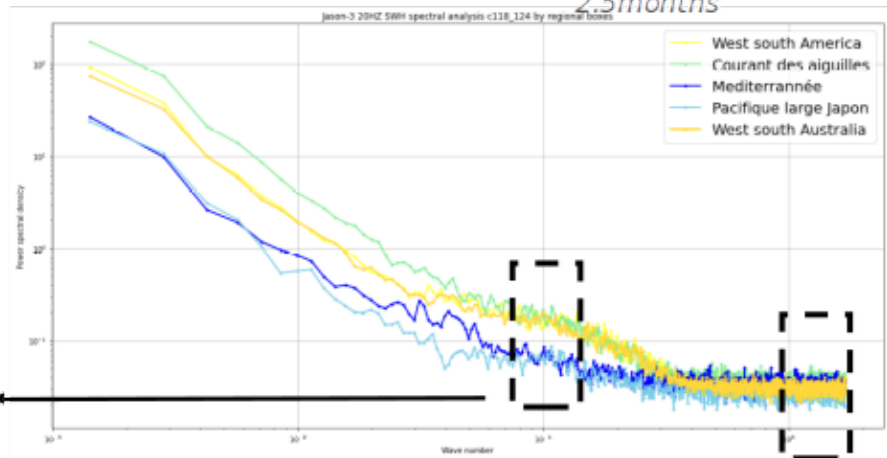
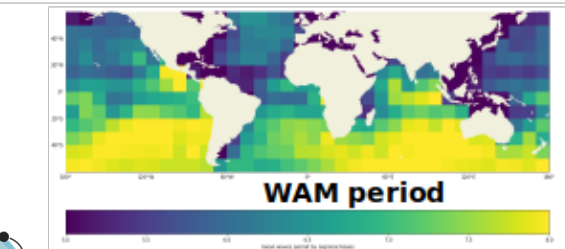
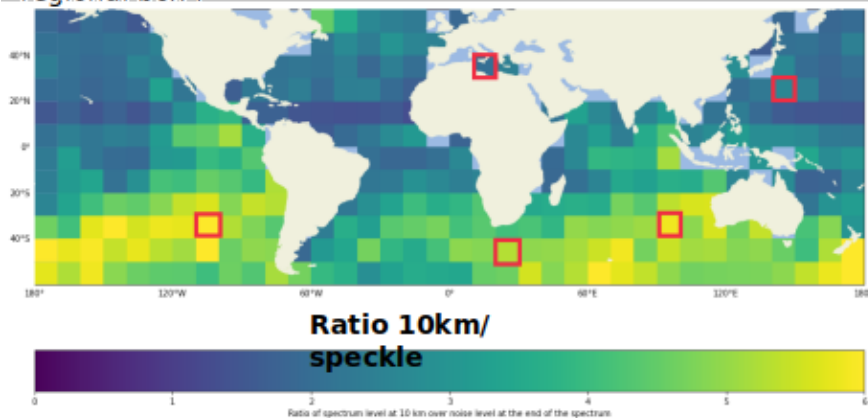


Regional spectral analysis : $10^\circ \times 10^\circ$ boxes

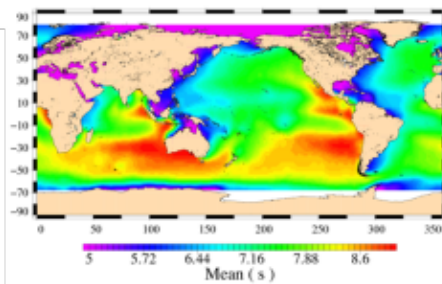
cycles 118 to 124 =

7 cycles = 2.5 months

We focus on the ~ 10 km bump ratio / speckle plateau:
 Ratio of mean spectrum energy at ~ 10 km over mean energy spectrum of the speckle plateau by regional box :



The 10km bump is directly related to the swell



Mean wave period over one year $\langle \text{numéro} \rangle$ WW3, Tran et al.)



Wind waves: spatial variability of envelope

