



The 2022 Tonga Tsunami in the Marginal Seas of the Northwestern Pacific Ocean

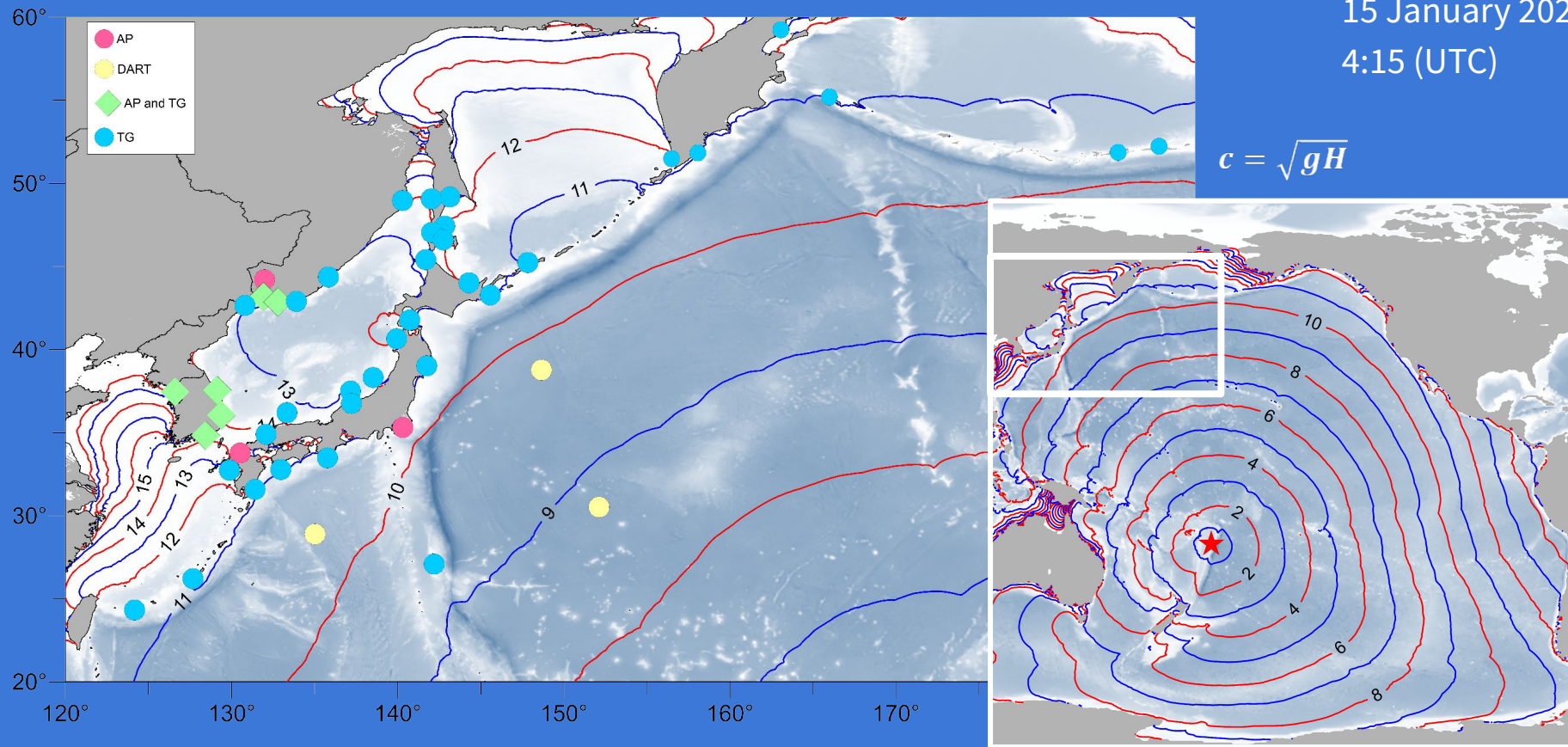
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Hunga Tonga Volcanic Eruption

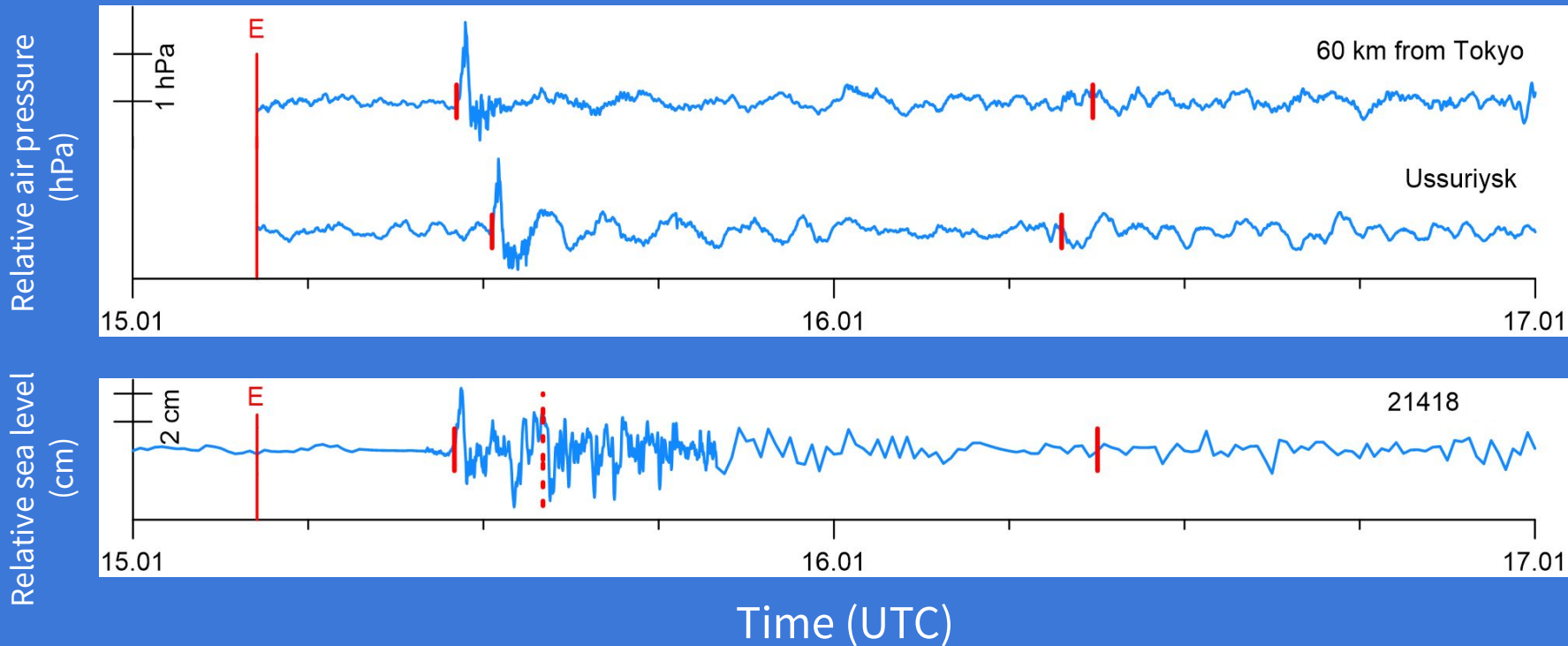
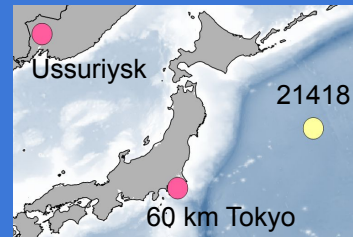
15 January 2022
4:15 (UTC)

$$c = \sqrt{gH}$$



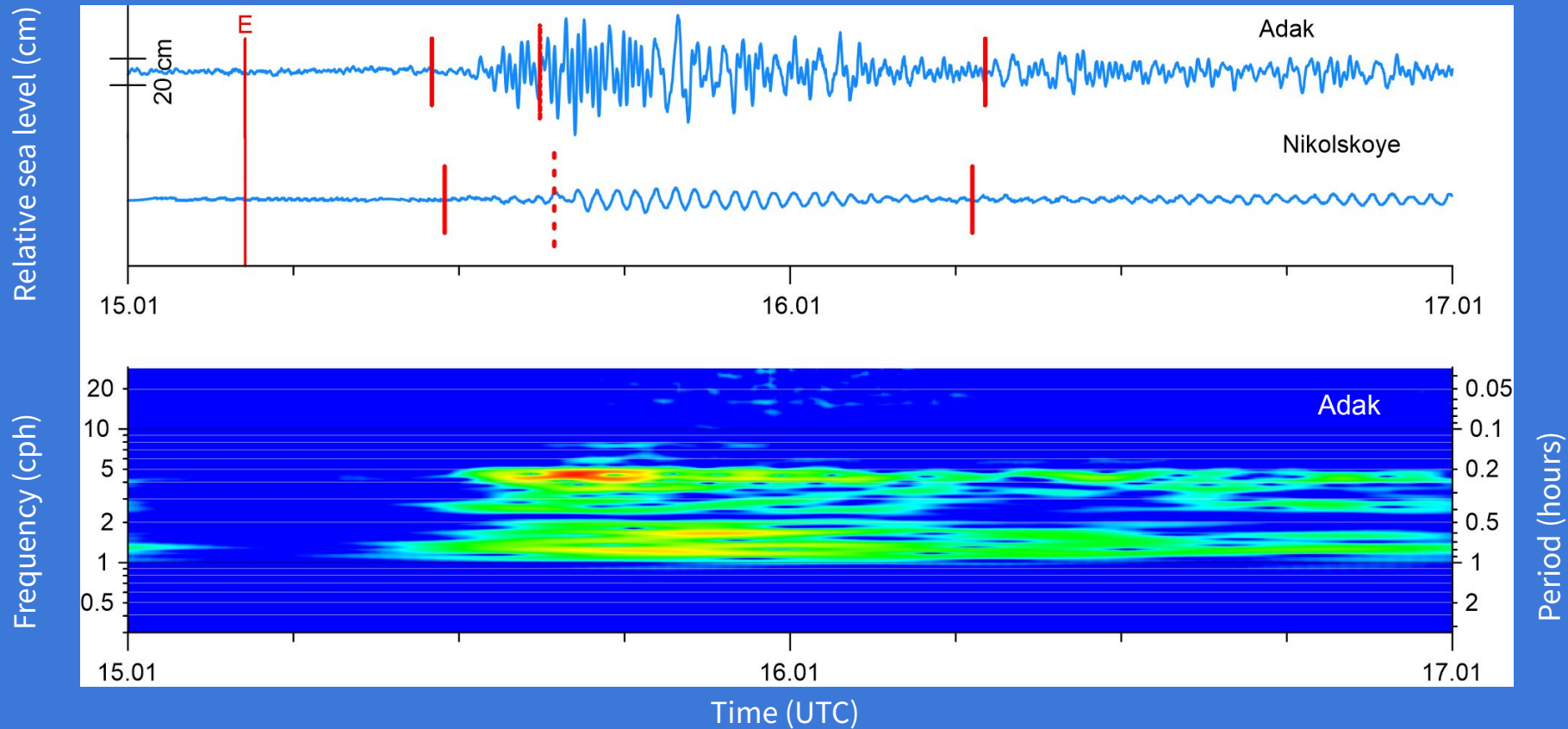
Waves in the Atmosphere

$R(P) = 2.6 \text{ hPa}$



Bering Sea (Aleutian Islands)

Hmax = 0.7 m (Adak)

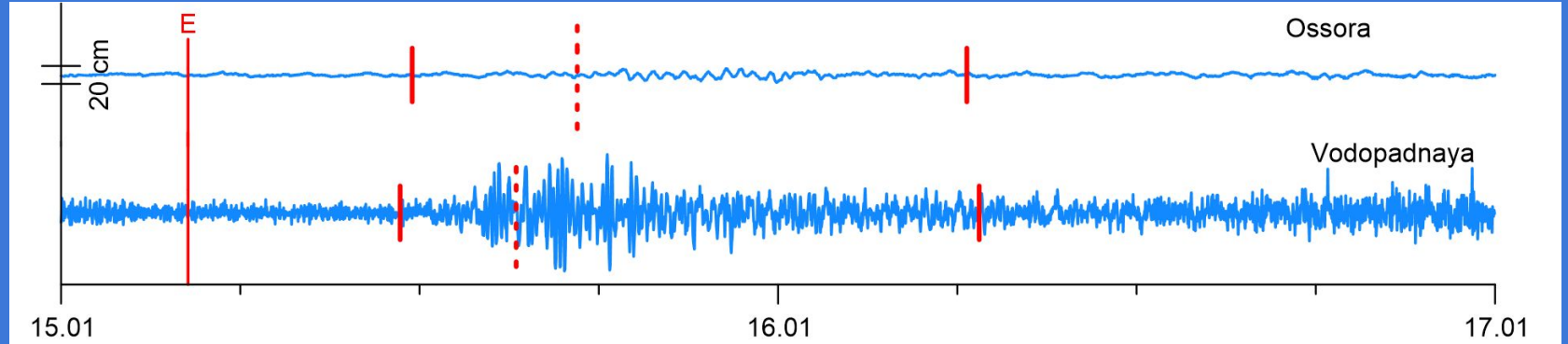


Bering Sea (Kamchatka)

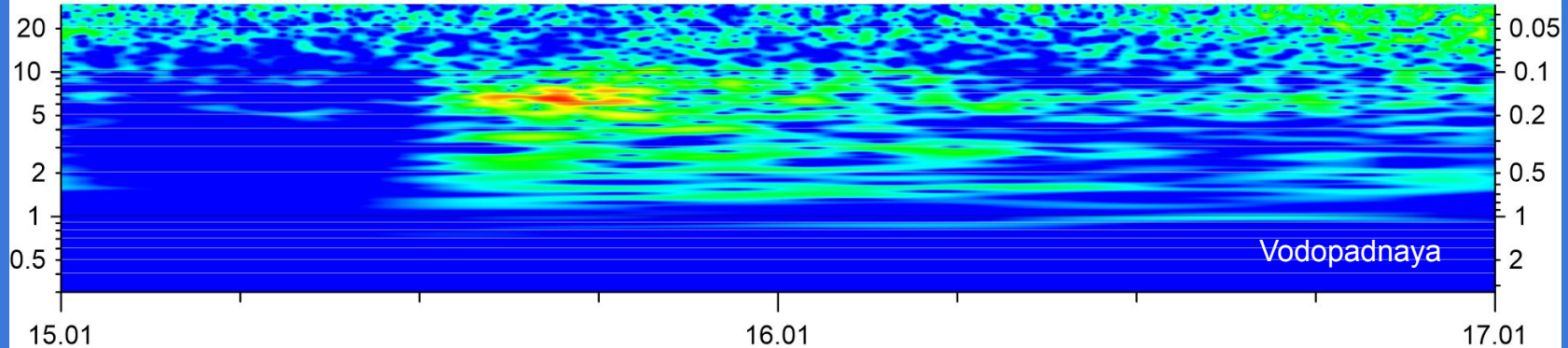
Hmax = 0.7 m (Vodopadnaya)



Relative sea level (cm)



Frequency (cph)



Period (hours)

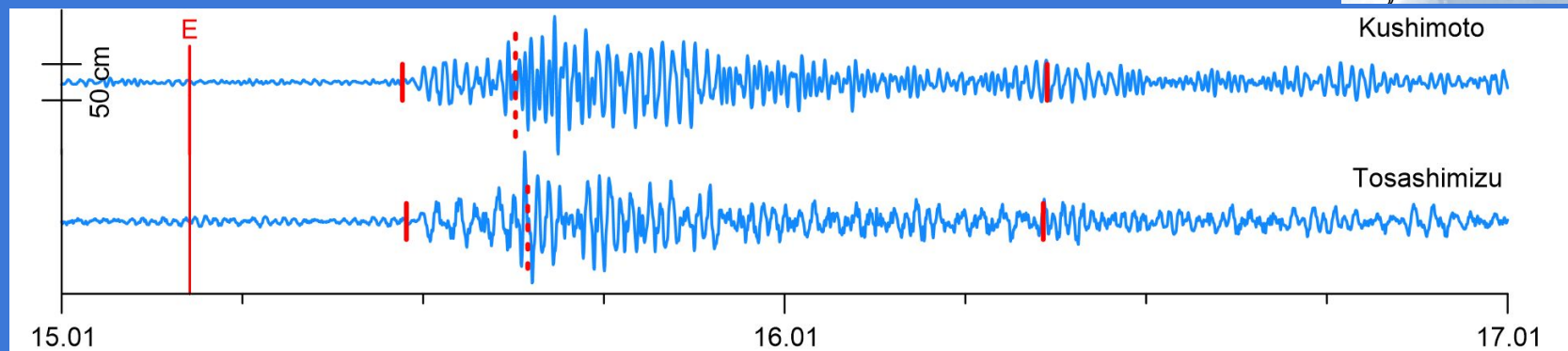
Time (UTC)

Pacific Ocean

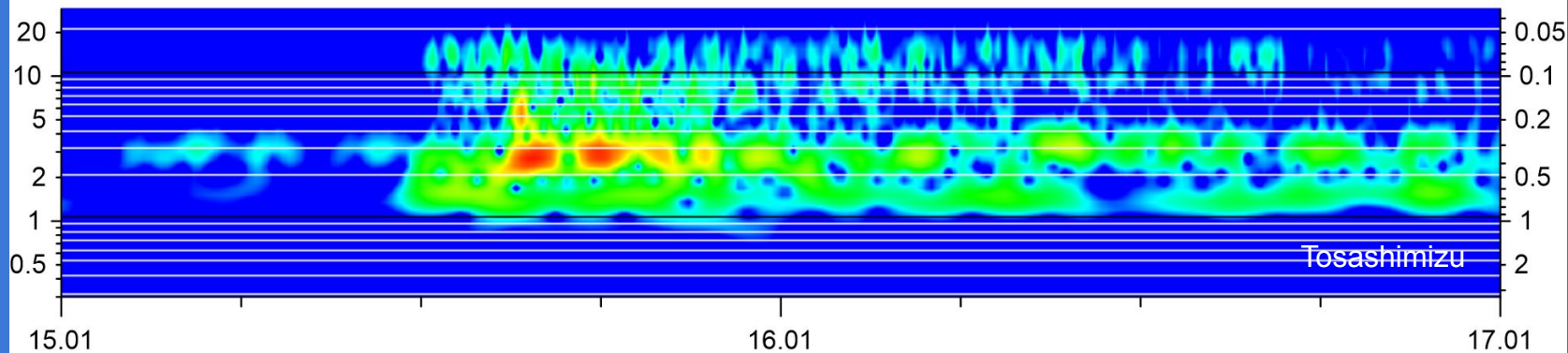
Hmax = 1.2 m (Amami)



Relative sea level (cm)



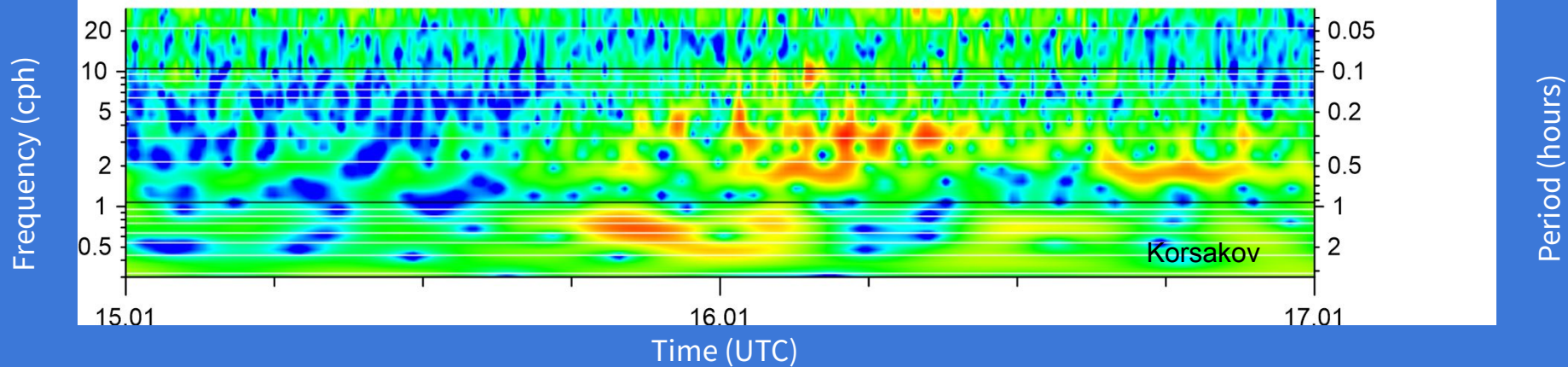
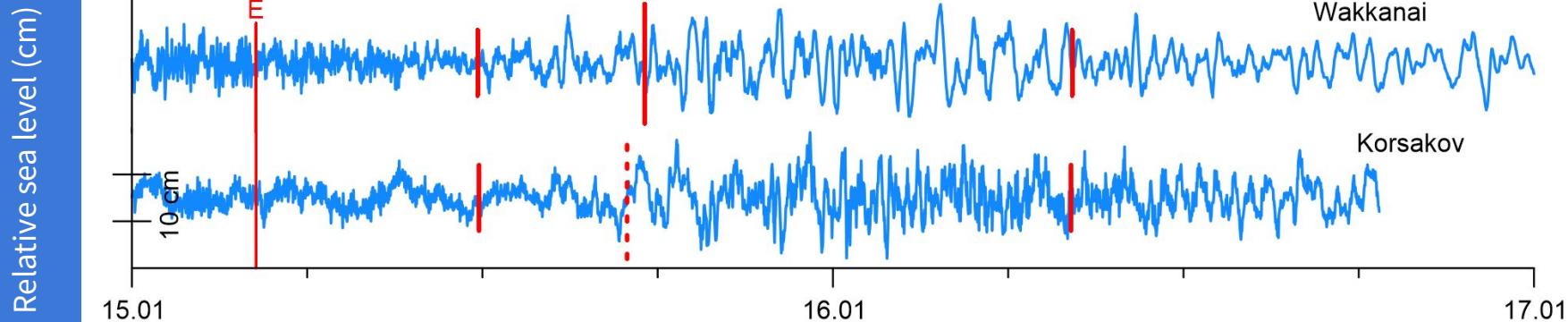
Frequency (cph)



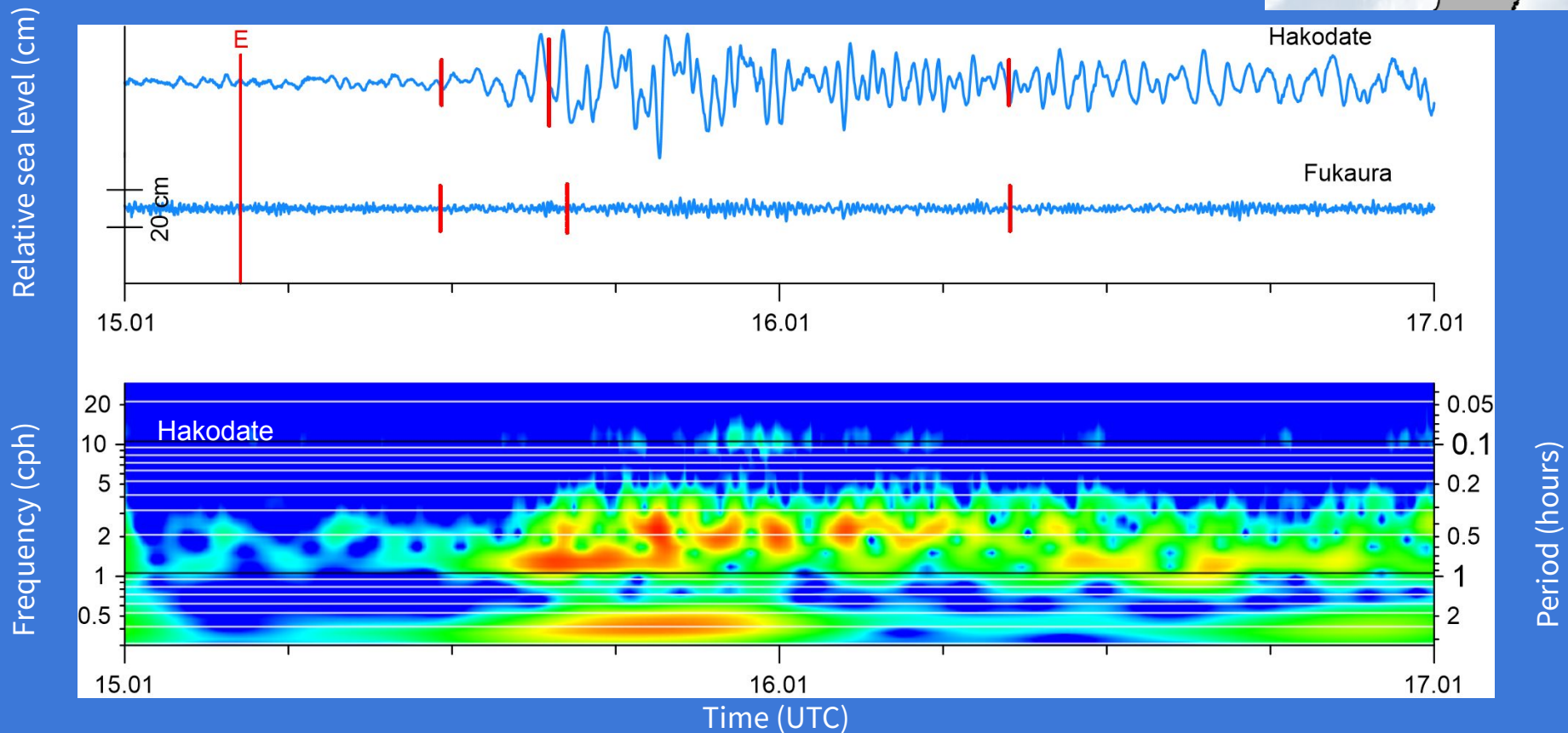
Period (hours)

Time (UTC)

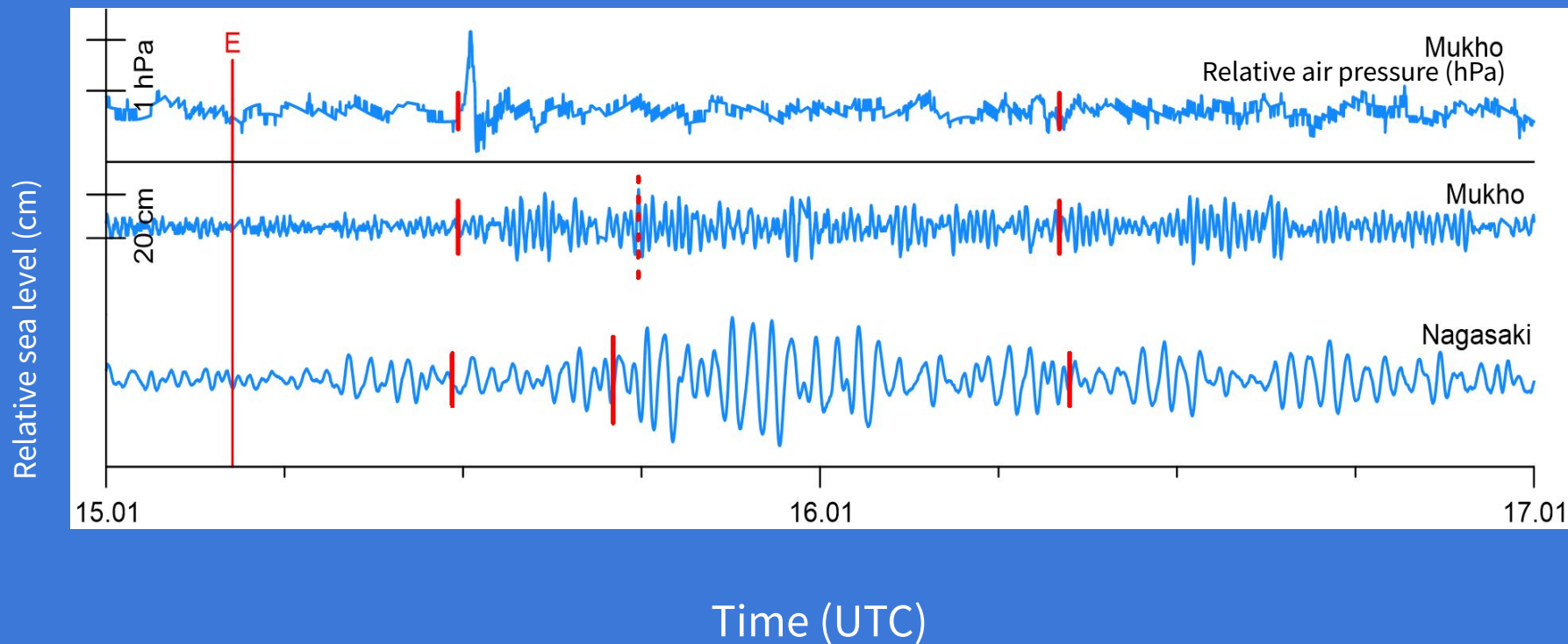
Sea of Japan (La Perouse Strait)



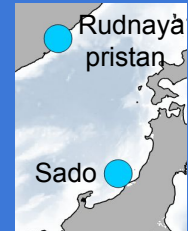
Sea of Japan (Tsugaru Strait)



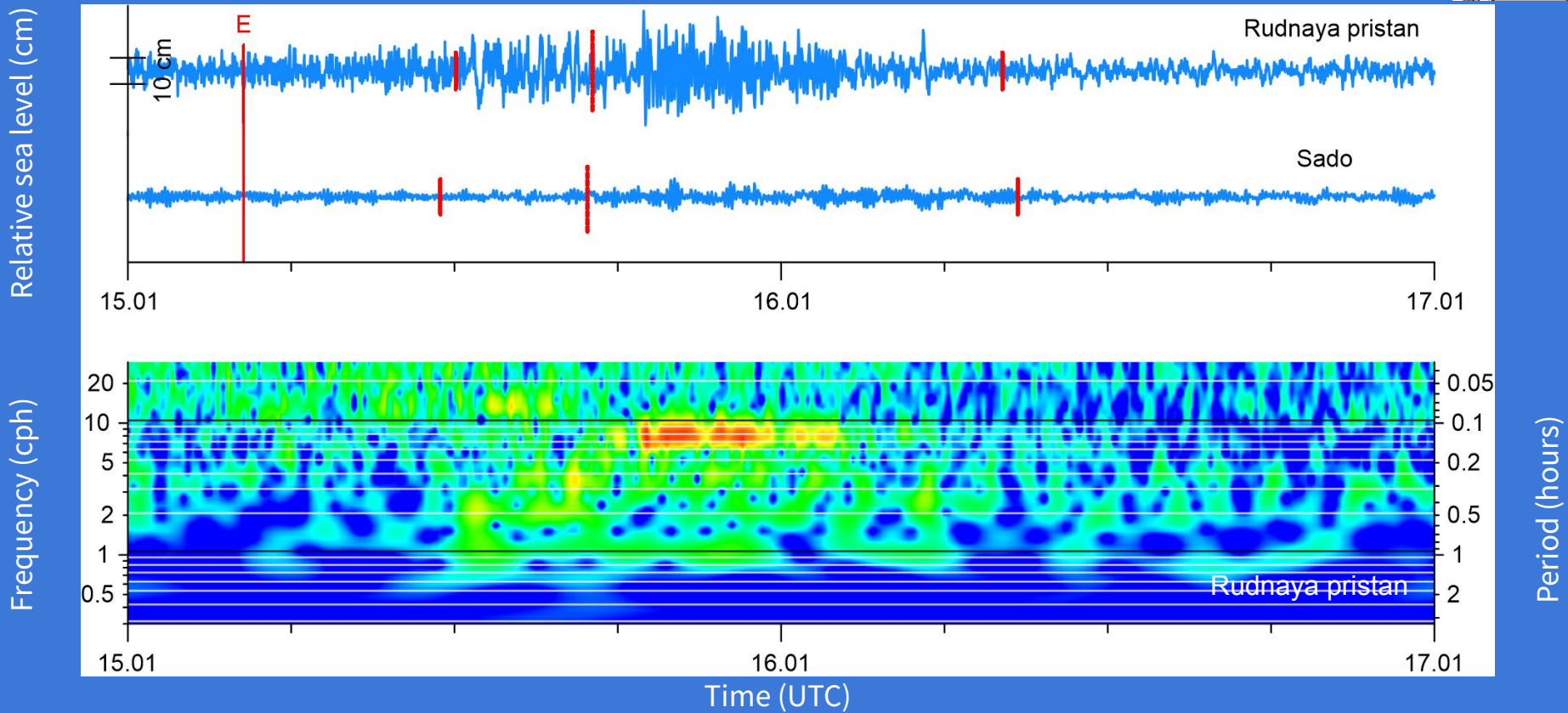
Sea of Japan (Korea Strait)



Sea of Japan



Hmax = 23 cm (Rudnaya pristan)



Conclusions

- On the Pacific coast, fast atmospheric and ocean waves are clearly visible
- Maximum height on the Russian coast was recorded at Vodopadnaya station. It is 0.7 m
- The Sea of Japan is a unique basin. It shows a strong response to the atmospheric wave, but almost does not respond to the ocean wave. Maximum height was in Rudnaya pristan = 23 cm
- After the wave penetration through the Aleutian Ridge, the tsunami height in the Bering Sea is low (7 cm on the west coast), but the waves are clearly distinguishable in wavelet diagrams