1 Supplementary

Following Portilla et al. (2009), an estimate of the ratio between the peak energy of the wave spectrum and the peak energy of a Pierson–Moskowitz (PM) spectrum with the same peak frequency, $\gamma^{\star}$, was calculated. Specifically,

$$\gamma^{\star} = \frac{E_{obs}(f_p)}{\alpha g^2 (2\pi)^{-4} f_p^{-5} e^{-5/4\gamma}} \tag{1}$$

where $\gamma = 1$ and $\alpha = \alpha_{PM} = 0.0081$.

In that work, observations with a $\gamma^{\star} < 1$ were considered swell. Here, a stricter threshold of $\gamma^{\star} < 0.5$ was used to select the observations at which swell forecast skill was assessed in order to clearly assess wave fields where energy was present in the lower frequency bins. The relationship between $\gamma^{\star}$ and the distribution of energy across frequencies can be seen in Figure 1, where observations with a peak period proportionally higher than the mean period had a lower $\gamma^{\star}$.

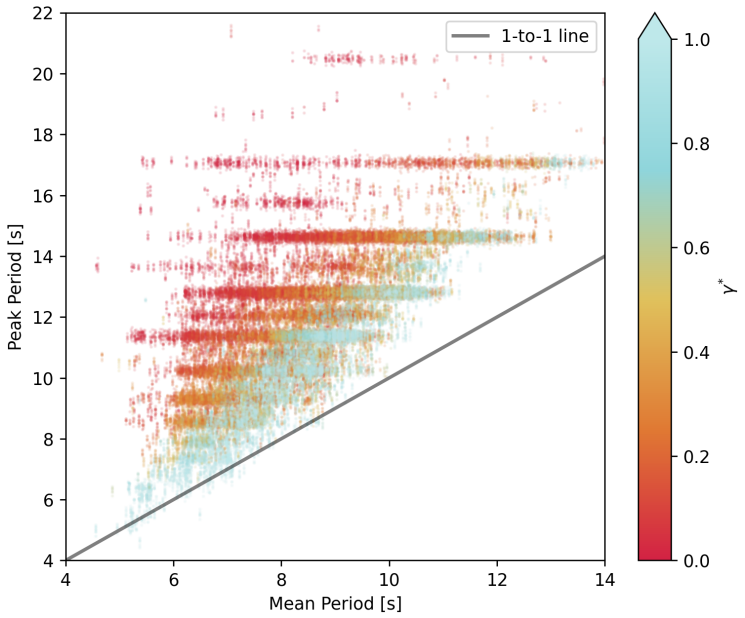

Figure 1. Scatter plot of mean period and peak period from the Spotter observations used in the sea versus swell significant wave height analysis, colored by $\gamma^{\star}$.

References

Portilla, J., Ocampo-Torres, F. J., & Monbaliu, J. (2009, 1). Spectral Partitioning and Identification of Wind Sea and Swell. *Journal of Atmospheric and Oceanic Technology*, *26*(1), 107–122. Retrieved from `https://journals.ametsoc.org/view/journals/atot/26/1/2008jtecho609_1.xml` doi: 10.1175/2008JTECHO609.1