

The first set of runs with bars was made with a water level of $LLW + 0.61m$, which corresponds to the level of the first profile break $100m$ seaward of the high-tide beach face. Figure 12 shows the reflection coefficient (solid line) and transmission coefficient referenced to the shoreward depth (short dashes) for the initial configuration of 4 bars at an equal spacing of $40m$, over a range of wave periods from $5sec$ to $20sec$. The main Bragg resonance peak is located near $T = 14sec$, and first and second superharmonic peaks are apparent at $T = 7.5sec$ and $T \approx 4.5sec$. The reflection response has a sharp drop off in the range $T = 10 - 11sec$, and the initial configuration is thus not well suited to the proposed storm condition with $T = 12sec$. (Response centered on the annual mean of $T = 14.69sec$ is significantly better).¹

In order to shift the Bragg-resonance peak more towards the $12sec$ storm period and broaden the overall response, a staggered array of 4 bars was tested next, with the shoreward and seaward bars at the same location and an internal spacing of $30m - 40m - 50m$. The response resulting from this spacing is shown in Figure 13. Staggering the spacing had the desired result of broadening the response characteristics with no concurrent reduction of the magnitude of reflection. This approach thus appears to be quite successful in the sloping beach application.

Two additional runs were performed in order to test the shifting of bar spacing as in the previous section. Figure 14 shows the reflection response for 4 bars at a uniform spacing of $80m$ (a rough one-wavelength/bar space in the $14sec$ band). The increased number of spectral peaks in the response is apparent as in the previous section, but the overall response drops off. This is likely to be due to the increase in depth over the seaward bars, which renders these bars less effective.

In Figure 15, the results for a regular spacing of $20m$ are shown (again using 4 bars). The main Bragg resonant peak is now shifted to $\sim 8sec$, and there is no spectral peak in the $10 - 15sec$ band. This case is not applicable to the West Coast site under investigation, but

¹(Wave data values from DeVries, 1987)