

sinusoidal bottom. This indicates that the reflection response should be spread over a broad band of wavenumbers, with intensified response occurring near the spectral peaks of the bottom variation. (Compare to the case of a single discrete rectangular bump, for which the spectrum is nearly white and the reflection coefficient varies nearly sinusoidally with wavelength). The drawback to this particular type of broadening of the reflection response is that much of the bottom variance is dedicated to reflecting wave components which are outside the range of wave periods where reflection is to be concentrated. It would be more efficient from a design point of view to devise a bottom configuration which concentrated the bottom variance in spectral components corresponding to the band of surface waves of interest. The practicality of constructing such arrangements, which would tend back towards the sinusoidal configuration, is doubtful.

The amplitude variance associated with the first spectral component of the regularly-spaced bar configuration corresponds to a sinusoidal bar with amplitude  $0.008m$ . Reflection from such a bar field was computed and is shown in Figure 5 as the dash-dot line. It is apparent that most of the reflection near peaks of the response is associated with Bragg-reflection from the individual bottom spectral components, but that non-resonant interaction with other components of the bar field can overlap the region of resonant response, causing a shift in the apparent peak amplitude. Kirby (1986) has shown that the reflection in the vicinity of a resonant peak for one particular bottom component is almost equal to the simple sum of the reflection contributions from all spectral components. (See, in particular, Figures 5 and 6 in Kirby (1986)).

The results above raise the question of whether bar fields consisting of relatively abrupt, isolated structures should be constructed with a dominant spacing equal to the dominant surface wavelength (or some other spacing), rather than to half the dominant wavelength as would be the case for a simple sinusoidal bottom. This hypothesis will be tested further below.

Another feature needing investigation is the effect of spacing the bars irregularly in