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Resonance tongues for higher order Bragg reflection of water waves[1] JIE YU, Civil, Construction and Environmental Engineering, North Carolina State University, LOUIS HOWARD, Department of Mathematics, MIT — It is well-known that a series of corrugations on the bottom of a layer of water of otherwise uniform depth can have a cooperative effect on incident water waves whose wavelength is close to twice the spacing of the corrugations. This is called Bragg reflection or Bragg resonance. We report here a study of similar effects when the spacing of corrugations is an integer (greater than 1) multiple of half the water wavelength. Using the exact theory formulated, we can readily construct the solution regimes, i.e. resonance tongues, within which the water wave amplitudes are exponentially modulated in space. These results are applied to study the effect of bottom corrugations on the normal modes of a rectangular tank.

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