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**Jie Yu\*** ([jie\\_yu@ncsu.edu](mailto:jie_yu@ncsu.edu)), 311 Mann Hall, Campus Box 7908, Raleigh, NC 27695-7908. *Bragg resonance, shore reflection and longshore sandbars.*

Multiple sand bars, nearly parallel to the shoreline and with approximately regular spacing, have been observed on some beaches. It remains unanswered how these longshore sand bars are formed, and what controls their spacing. On the other hand, it has long been recognized that a series of such bars on the seabed can have a cooperative effect on the incident water waves, called 'Bragg resonance' or 'Bragg reflection'. In this talk, we will discuss some recent work on Bragg resonance of water waves, with particular emphasis on the presence of some degree of shoreline reflection. A quantitative theory of longshore sand bar formation will also be discussed, which utilizes an asymptotic theory of Bragg resonance, wave-induced mass transport in the bottom boundary layer and sediment transport dynamics. An exact theory has been developed to examine the effects of Bragg resonance on the normal modes of a rectangular tank, and to compare with the asymptotic theory. (Received February 10, 2009)