



Strong wave transformation under uneven bottom: analytical results

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The wave transformation over the ocean shelf of variable depth is studied analytically in the frames of linear shallow water theory. Main attention is paid to the bottom configuration consisted from specific non-reflected profile matched with zone of constant depth. Process of wave approaching to the shore for this geometry is considered. The transformed wave can be found from the integral Fredholm equation of second kind. The shape of the transformed wave on a non-reflected beach differs from the shape of the incident wave. The runup height is computed analytically. It is significantly higher than for a beach with constant slope near shoreline. Such bottom profile can be source of anomalous amplification of water waves led to the coastal freak waves.