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Large amplitude edge waves on a beach

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Edge waves have been studied in the last decades in reference, mainly, to the rhythmical longshore patterns that appear on some beaches when suitable conditions are met with. The theory of excitation of edge waves by a normally incident wave train was carried out by many researches in the seventies of the past century. The names of Guza, Inman, Bowen, Davis and many others have much significance on this respect, though we know that Stokes already gave a general formula for edge waves (zero mode) in 1846.
Edge waves and the effect on beach topography can be small or very important depending on the wave amplitude and other characteristics (for instance, if they are progressive or standing waves). Pelinovsky and others pointed out the existence of freak edge waves that can generate topographic beach features and even flooding on nearby zones.
Recently on our northern coast (Asturies) we have come across an episode of a very large amplitude edge waves on Salinas Beach. This beach is bounded by a sea wall defending a promenade. After a period of very stormy maritime climate there was a severe erosion along the beach. The rhythmic features generated on the beach by edge waves(beach cusps with a wavelength of 400 metres) caused an adding erosion on specific locations and , as a result, the sea wall was damaged at the trough of the beach cusp system. The main aim of this presentation is to give a coherent interpretation of the data according the theory of resonant excitation of edge waves by normally incident waves, in particular, cusp amplitude, edge wavelength and edge wave amplitude.