# WAVE TRANSFORMATION ALONG AN APPROACH CHANNEL

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| **Abstract**: When a wave propagates from deep to shallow water regions, the change in wave characteristics is called wave transformation. The processes which affect wave transformations are refraction, diffraction, non-linear interactions etc. the study of the determination of wave transmission in ports is important in designing coastal structures and efficient port operations because wave agitation has influences on the manoeuvring and mooring of vessels. Also, it helps in efficient loading and unloading of ships. Approach channel plays a role in controlling the amount of wave energy entering the harbour. This paper depicts the study of the transformation of waves which encounter an approach channel when propagated towards port from offshore. The wave energy penetrating the harbour is influenced by the sudden depth change which the waves undergo. Long approach channel has a considerable effect on the propagation of waves in and around the port. This paper aims in studying the effect of a long channel direction on wave propagation using Numerical modelling software called MIKE21. The area considered for the study is New Mangalore Port (NMPT), one of the major ports located on the West Coast of India, at longitude and latitude 740 48’E and 120 55’ N respectively situated at Panambur, Mangalore, Karnataka State. It is an artificially developed lagoon type all-weather port with 5200 m long navigation channel dredged to –15.4 m depth contour. Numerical models act as an aid for assessing wave climates in ports with benefit that multiple conditions can be investigated relatively cheap compared to physical models. Transformation from nearshore to the area under consideration is done using MIKE 21 Boussinesq Wave Module (BW). The wave disturbance from different directions with respect true North, derived from MIKE 21 SW model is modelled. Also the difference in wave propagation while varying the time period is also considered. The change in reduction of significant wave height, spreading of wave energy, wave concentration, influence of incident wave field on the wave attenuation and amplification are all the factors which is evaluated and the results obtained showed that there is a considerable effect of approach channel in reducing the wave disturbances. The analysis showed that about 80 present of the wave energy has been reduced while reaching the ports due to long approach channel. |