**River and Coastal management**

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ESERCISE N.1

**Use EXCEL file Shoalingetcandwavesatbreakinpoint as a guide**

1)

a: Compute L and H on shallow water (h=10,8,6,4m) for wave trains with the following offshore properties:

T= 10; T=7 ; T=3; Ho=2,3, 4 ----. Also check that the Shallow Water hypothesis holds

b: compute energy flux for all the waves trains above, for all the water depths

(**Formulas on course notes)**

c: for h= 50, 40, 4, 2, 1 draw the Vx amplitude diagram as a function of depth z (z from 0 to h).

**Formulas on: https://en.wikipedia.org/wiki/Airy\_wave\_theory**

2)

Assume wave trains with the following offshore properties:

T=7 ; T=3; Ho: 2,3,4 ---and the following offshore direction wrt the perpendicular to the coast.

Gamma0= 15°, 30°, 45°, 60°, 85°

Assume the bathymetric lines are straight, and parallel to the coast. Also assume for simplicity, that breaking depth hb is given by hb=Ho/0.8

Determine wave height , wave energy flux, wavelength and direction at breaking point