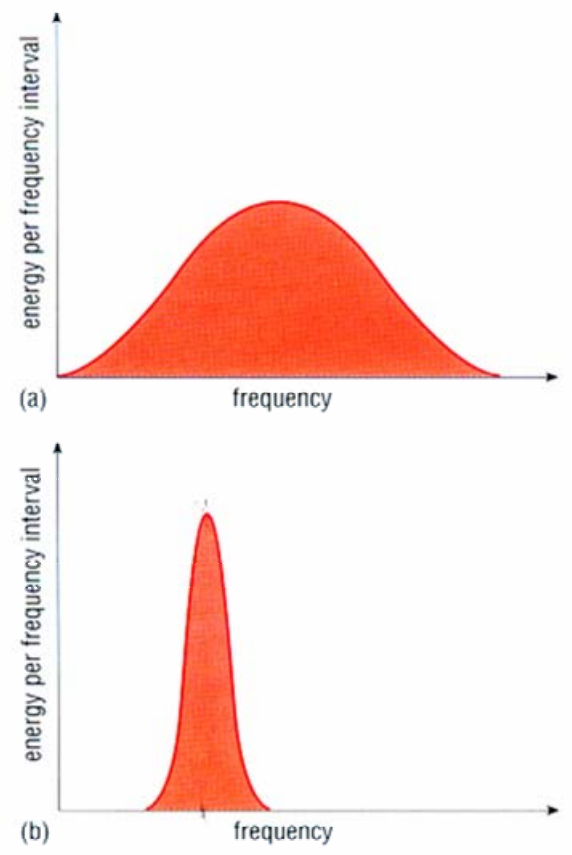
Introduction to Oceanography
EAS 4300

Homework #7: Review the chapter on "Ocean Waves and Tides"

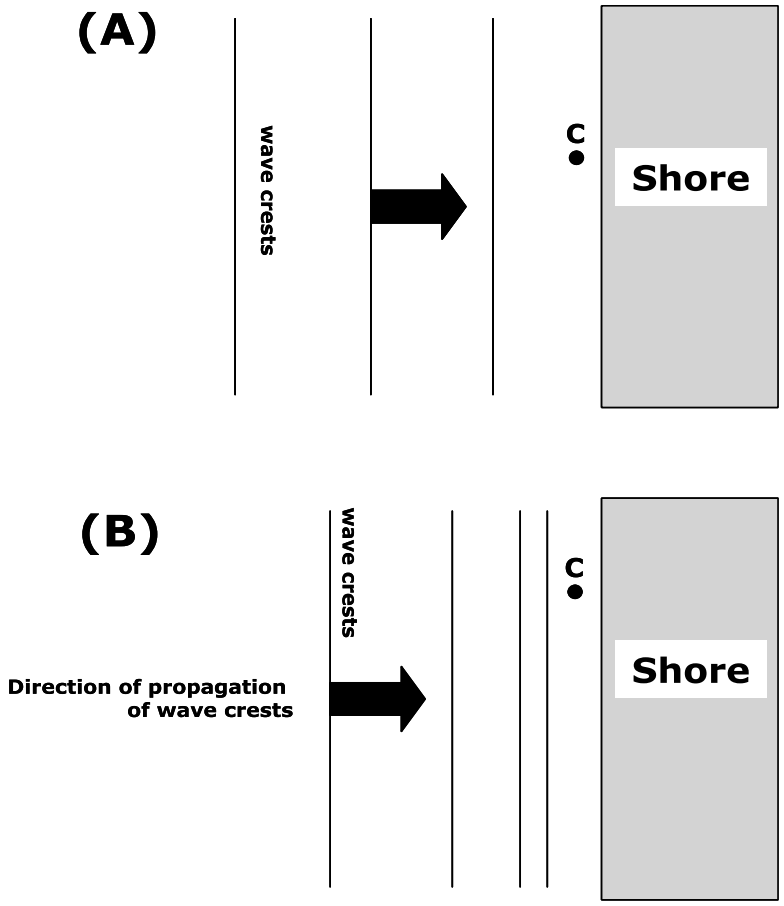
Question 1:
This is a figure of 2 different wave energy spectra. One represents the wave field energy in a storm-generating area; and the other represents the energy of the wave field in an area far away from the storm, but receiving swell from it.



a) Which of the two spectra represents which situation?

b) Explain why the shape is different?

Question 2:
We will now compare the wave filed at location A and B.



a) In which of the two following cases would you expect higher waves heights?

b) Where do you expect to have shallower water depth close to shore?.

c) Explain how wave crests in the drawing help you determine your answer in (a) and (b)?

c) Which waves travel faster through C? Explain how the drawing of the wave crests can help you determine this.

d) If you where measuring the rate of supply of wave energy at point C, how do expect it to be different in A and B? Explain. (Be careful I asked for the rate of energy and NOT the energy at pt. C)

Question 3:
The figure below shows a map of global amphidromic systems associated with the lunar tide (M2).

a) Label one amhidromic point. Clearly label one cotidal lines.

b) What is a Corange Line in tidal charts? Draw one corange line for the amphidromic system in the North Atlantic.

c) Do wave crest travel faster at Pt. 1 or Pt. 2 in Figure 2? Explain.

d) Where are the tidal elevations expected to be higher at Pt. 1 or Pt. 2? Explain why.

f) Draw the direction of propagation of the tide at Pt. 2? How can you tell from the chart.

g) How many high tides do you expect in 1 day? If the sun did not exert any graviational pull on the earth, how many tides would you exect x day?

e) We have learned about the differences between the equilibrium and the dynamical model of tides. If the planet was not rotating and there where no continents, would you expect these two models to give the same answer. Explain.