

CHAPTER 15: WAVES AND ROTATING FLOWS**Reading:**

Chapter 15 of Blandford and Thorne.

Suggested movies for download and viewing:

1. *Rotating Flows* by D. Fultz;
2. *Secondary Flow* by E.S. Taylor – those portions dealing with flows that have large vorticity;
3. The non-shock-wave portions of *Waves in Fluids* by A.E. Bryson.
4. The very short film clips about solitonic solutions of the KdV equation available at <http://www.math.h.kyoto-u.ac.jp/takasaki/soliton-lab/gallery/solitons/kdv-e.html>

The first three of these movies are available at

<http://web.mit.edu/fluids/www/Shapiro/ncfmf.html> .

The film clips that I showed on Monday were from the first two of these movies; those on Wednesday were from the third.

Problems**A. DO TWO OF THE FOLLOWING FIVE EXERCISES:**

1. Exercise 15.1 Fluid motions in gravity waves, OR
2. Exercise 15.5 Ship waves, OR
3. Exercise 15.6 Shallow water waves with variable depth; tsunamis, OR
4. Exercise 15.7 Breaking of a dam, OR
5. Exercise 15.9 Two soliton solution: parts (b) and (c).

C. DO:

1. Exercise 15.10 Winds and ocean currents in the north Atlantic, OR
2. Exercise 15.11 Circulation in a tea cup

D. DO:

1. Exercise 15.13 Radiation reaction without the slow motion approximation, OR
2. Exercise 15.14 Sound waves from a ball undergoing quadrupolar oscillations