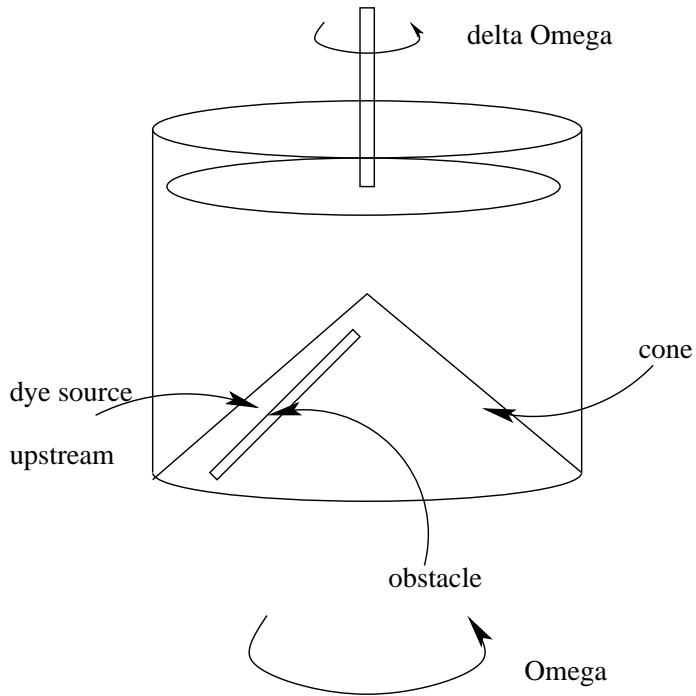


## 12.804 — Rossby Waves — Tank Experiment

### Setup

You can produce a “beta-plane” in the tank with a setup like that shown.



Show that in the Cartesian version, that the effective  $\beta$  is  $f \times \text{slope}/H$  so that

$$\frac{\partial}{\partial t} \nabla^2 \psi + J(\psi, \nabla^2 \psi) + \frac{f \times \text{slope}}{H} \psi_x = -r \nabla^2 \psi$$

is the relevant equation.

If you put an obstacle on the cone, and then rotate the upper lid at angular frequency  $\delta f/2$  relative to the tank, you can produce a zonal flow across the obstacle.

### To do:

Figure out the wavelength of the waves and pick a suitable  $f$  and  $\delta f$ . Look also at cases with  $\delta f$  negative.

What about nonlinearity? Can you keep it small?

Carry out the experiment(s).