## 2019-02-13: Prelab and investigation of lab manual

### 4:02 PM: First inspection of content in lab manual

**Introduction:**

The purpose of the lab is to observe and measure the dispersive properties of water waves. Since the frequency in time of the water wave is not exactly proportional to its wavenumber, the phase velocity and the group velocity of the wave will be different, meaning that water waves are dispersive, with the following relationships:

Remaining questions:

* How do we identify group velocity and phase velocity from the raw datapoints? (needs more background research)
* How can we relate this to an actual quantity? Does the analysis give way to some real-life quantities that have been measured often/precisely?
* From Landau and Lifshitz p.39: how does the velocity potential relate to the actual group/phase velocities?
* Step 1 in the procedure says that the group and phase velocities are supposed to be for depths of 1cm, 10cm, and 100cm. How are we supposed to do the 100cm depth if we don’t have a 100cm deep tank? (max depth seems to be about 15cm?)

**Procedure:**

Refer to page 115 of the ENPH 352 lab manual.

QRD1113 spec sheet used for “calibration” of the voltage output vs the actual depth (no Internet access currently, but update later with a link

Target is to use MATLAB to find the calibration factor, then link the voltage output to an actual depth.