Problem Set 2, problem 2

There are 3 types of files that you will need, file names and contents are as follows:

station.loc: station number,date, time, latitude, longitude, and depth. (nb. W and S are negative)

station##.ctd: pressure(dbars),temperature(ITS-90), salinity(PSS-78), oxygen(umol/kg), #obs and quality. The data have been sorted into 2dbar bins. The temperature will need to be converted to IPTS-68 before using any UNESCO routine (physical properties of seawater...phyprop).

t68=t90*1.0024

sta##.lad: depth(meters),u(cm/s),v(cm/s). The ladcp data are averaged into 10 meter bins.

Geopotential anomaly can be calculated using the *phyprop* toolbox which is in the lecture notes section of this course. You will need to use the m-file *sw_gpan*. If this toolbox is in your Matlab Path, type help [file] to get information about the file [*sw_gpan*]. For pairs of stations, geostrophic velocity requires that the distance between stations be calculated. The geostrophic velocity is normal to line joining the two station pairs. You will need to use this when comparing geostrophic velocity to the measured east and north velcity components. I suggest you use the m-file [*sw_dist*] (also in phyprop toolbox). You can also use the routine *sw_gvel* (in phyprop) to calculate geostrophic velocity directly, but you are responbsible for understanding how it is done (and for the correct answer!).

Note that the CTD files are different lengths as both the start and final pressures can vary from station to station. Finally, be aware that the geostrophic velocity is in m/s vs. pressure but the LADCP velocities are in cm/s and depth. Pressure can be converted to depth using a standard ocean density following Saunders. This m-file is in the phyprop directory and is called *sw_dpth*(pres,lat). Matlab routine *sw_pres*(depth,lat) converts depth to pressure.