

SIO 217B Atmospheric and Climate Sciences II

Exercise #7

1. Download the files containing Z_{1000} , T_{1000} , u_{1000} , and v_{1000} for 1993 March 14 00Z. Using a centered finite difference method for spherical coordinates, calculate horizontal temperature advection. Plot height, temperature, winds, and advection in the domain 20-50°N, 270-310°E. If possible, plot all of these parameters in the on the same plot using various colors or line patterns.
2. Where appropriate, draw a cold front, warm front, occluded front, and stationary front on the plot. Recall that fronts are located on the warm edge of regions of strong temperature gradient and are often associated with shifts wind direction and surface troughs (although this is not so apparent in the model Z_{1000}). You may also find it useful to examine the distribution of temperature advection. Cold fronts occur ahead of strong cold advection, and warm fronts occur behind strong warm advection. Occluded fronts occur along a tongue of warm air between strong cold advection and strong warm advection. Stationary fronts occur where advection is weak.