The purpose of this assignment is to give you an appreciation of the magnitude of the individual terms that contribute to the ageostrophic wind in the absence of friction.

Select an active synoptic event of your choice (real time or archived). Use a gridded dataset (e.g., the GFS) and compute the magnitudes of the three terms in the ageostrophic wind equation given below. Make your computations at several different six-hour time periods to enable you to examine the time-dependent behavior of the individual terms. Evaluate the isallobaric wind (term A) at 1000 hPa or sea level, the along-flow wind variation (term B) at 250 hPa, and the product of the vertical motion and vertical wind shear (term C) over the 1000-700 hPa layer (use the vertical motion at 700 hPa).

Discuss your results synoptically.

$$(\widetilde{\boldsymbol{V}} - \widetilde{\boldsymbol{V}}_{g}) = \left(\frac{1}{f}\right) \widehat{\boldsymbol{k}} \times \partial \widetilde{\boldsymbol{V}}_{g} / \partial t + \left(\frac{V}{f}\right) \widehat{\boldsymbol{k}} \times \partial \widetilde{\boldsymbol{V}}_{g} / \partial s + \left(\frac{w}{f}\right) \widehat{\boldsymbol{k}} \times \partial \widetilde{\boldsymbol{V}}_{g} / \partial z$$
(Term A) (Term B) (Term C)