

Project 2

(2/1/21, Due 2/8/21)

1. An advection model (*advec1.f90*), which is written in FORTRAN, solves a one-dimensional advection equation numerically.

Download the advection model from the MesoLab website: (NWP Project 2 *advec1.f90*).

2. Adjust the flag "NPR" to run longer, e.g., twice longer than the control case, and write out the data for more time steps (e.g., 20 outputs). Then use grads to plot the output and make a movie for the animation. Document the evolution of the wave motion, such as changes on the initial bell-shaped wave? Try to explain why.
3. Run a sensitivity test by changing NL to 1 (i.e., nonlinear) and then compare with the control experiment (NL=0) as performed above. Then use [GrADS](#) or a preferred plotting software (e.g., [NCL](#)) to plot the output and make a movie for the animation. Construct a table to document the differences between the nonlinear and linear cases, and try to explain the nonlinear effects on the initial wave.