Chris Oehrlein* (coehrlein@occc.edu). Using Atmospheric Data to Determine How Well a Separable ODE Models the Vertical Motion of a Dry Air Parcel.

Using basic thermodynamic principles as the foundation, Atmospheric Physics contains many relationships that students taking Introductory Differential Equations, Integral Calculus, and Multivariable Calculus students can model. Assuming no exchange of heat as a dry air parcel rises leads to a separable, first-order, ordinary differential equation relating the parcel’s temperature to its pressure. How well does NOAA data fit the analytic solutions to the separable ODE? Students can sample NOAA datasets from a variety of years and world locations and plot this data against the analytic model. By assigning each student or small group of students a different data set from which to sample, opportunities for the investigation of many different data analysis topics arise – topics that our math, physics, and engineering majors do not formally encounter until later in their programs, if ever. (Received September 17, 2019)