Box Cavity Example
Unsteady inviscid transient of a conserved species convected around 180 degrees (a half vortex). Demonstrates the adaptive control volume method. Example from paper AIAA-2014-2780, "Using Multi-Dimensional Linear Discretization Over Unsteady Convection Adapted Control Volumes", by Joan G. Moore and John Moore.

Unix instructions to run the example
Bring up a terminal window and cd to box.cavity.example, then
mkdir out
mkdir out/cc
../../a.m4d < in.alim.1llo2cdt.1 > out/print

Input/Output
The primary input file - in.alim.1llo2cdt.1, uses several other input files for specific tasks.
inn.grid11x6 - set up an 11x6 grid using the master geometry, geom.cartesian, then calculate other geometric arrays.
inn.init - set the fixed velocity and density. Initialize the concentration and parameters ITER and TIME.
inn.init.coefLL - determine the convection adapted control volumes. Set the convection and time term coefficients using linear profiles in space.
inn.plotcv - plot the grid (red) velocity vectors (black) and control volumes (blue). Gives out/cv0.gif.
inn.plotcc - plot the current concentration as color fill. (Results in dir. out/cc)
inn.plotbarcc - plot the color bar for the concentration. Gives out/ccbar.gif.
inn.step.o2c - take 1 time step, with analysis added to file out/converge.
inn.plotconv - gives lineplot file out/convline. Then plots out/dccdt.gif and out/ccrange.gif

The concentration after 50 timesteps and 1000 timesteps is dumped to files out/cc50 and out/cc1000 by the primary input file, in.alim.1llo2cdt.1.

Compare results with those obtained by jgm.
Post-processing of output by jgm
mv out out.jgm. Delete all concentration plots except ITERs 0,10,50,1000.

Suggestions for variations to try

Copy the primary input file and change the control volume parameter, alim, keeping 0<alim<=0.5.
Change the time step.
Copy file inn.grid11x6, then set up a finer grid (uniform or nonuniform) by modifying the input to command gridfrommefp.