**MAGIC master tutorial**

This version of MAGIC has the capability to run with both time-dependent profiles and static profiles. The majority of the code remains the same between the two versions, however, the time dependent profile version utilizes setaux\_dynamicbg.f and /mpi/claw3ez\_mpi\_dynamicbg.f, whereas the static version uses setaux\_staticbg.f and /mpi/claw3ez\_mpi\_staticbg.f. There are two version of the MakeFile that can be called to compile either version (if using the non CMake method to build).

**To compile with MakeFile:**

Make xclawmpihdf

For the static version (uses just one profile.data file)

Make -f Makefile.dynamic xclawmpihdf

For the dynamic version (uses a profile9XXX.data file for each time step, i.e. first time step is profile9000.data, then profile9001,data etc).

This version also has both the thunderstorm forcing for precipitation driven files and the analytical plume forcing. To run a precipitation driven case uses the flag forcemth =2 in setprob.data. For an analytical plume use forcemth=3.

**To compile with CMAKE:**

Firstly, you need h5fortran installed, this can be done using the following:

-Cd into the h5fortran/scripts directory (you may also need to load cmake first

cmake -B build -DCMAKE\_INSTALL\_PREFIX=~/local -Dhdf5\_parallel=on

cmake --build build

Once this is installed, go into the MAGIC\_master directory and type:

cmake -B build -DHDF5\_ROOT=~/local

cmake --build build

This will build the version with the static MAGIC backgrounds. To build the dynamic background version, cp CMakeLists\_dynamic.txt to CMakeLists.txt, remove the build folder ( rm -rf build) and follw the steps above.

**Example Cases:**

1. **Analytically specified plume**

The analytical specified plume example is in the Analytical Plume example folder. To run this case, first

1. **Real radar driven case**