

Where to find the data

The time-series data for each hurricane of Category 1-5 intensity is within the `hurricanes_newSims/Cat*_sst*/Results/timeSeries_d02` directory.

The file (`tslist`) showing the location of each virtual tower relative to the south west corner of the domain (i.e., $(i,j) = (0,0)$) is within the `hurricanes_newSims/Cat*_sst*/reictory`. Note that the Category 2 storm (`Cat2_sst27`) has additional time-series data meant to be used as input for OpenFast (i.e., `tslist_OF`).

Time series output in WRF:

The time-series output in WRF records atmospheric quantities at a given location for every time step of the simulation. For the hurricane simulations, the time series output records the three wind speed components and height at every time step.

- UU: u-wind/zonal component [m s^{-1}].
- VV: v-wind/meridional component [m s^{-1}].
- WW: w-wind/vertical component [m s^{-1}].
- PH: height above the surface [m].

The naming convention for a time series output file is as follows:

`name.d##.XX`

- name: name for each time series location (specified by the user, here “d3###”)
- d##: domain for time series output
- XX: variable in time series output

For example, the file `d3118.d02.UU` contains the time series output for the u-velocity component in domain 02 of the simulation at location `d3118` specified by the user.

The time series output files have a specific format. The first line in each file has the following convention:

```
name domain_ID timeSeries_ID (lat,lon) grid_indices:(index_x,index_y) actual_lat_lon:(lat,lon)
```

The `name` of each time series location is specified by the user and should match the name of the file. The `domain_ID` is the domain number for the time series output. The `timeSeries_ID` is the time series location within the `tslist` file (i.e., irrelevant for end user). Given that our simulations are idealized, the values for `(lat,lon)` are zero. The `grid_indices` represent the grid cell for the time series output within the domain.

The rest of the lines in each file follow this convention:

```
time var_z1 var_z2 var_z3 var_z4 var_z5 var_z6 ...
```

The first column (`time`) represents the time since initialization in hours. Initialization time for the high-resolution domain (i.e., `d02`) varies for each hurricane simulation.

The remaining columns (`var_zi`) provide the output for each variable at increasing vertical levels in the domain. The staggered vertical levels for each output are provided

in the `name.d##.PH` files. Note that the height coordinate changes slightly with every time step given that the vertical coordinate in WRF is a function of hydrostatic pressure.

The file `tslist.txt` provides the names and locations $((i, j)$ grid point in d02) for each time series output file.