Motivation:
- Progress in forecasting and understanding hurricanes is being hindered by uncertain settings in parameterization schemes (especially boundary-layer and surface-layer schemes).
- This study aims to reduce this uncertainty by evaluating a large set of simulations that systematically vary the surface drag coefficient and the length scales in a turbulence/PBL parameterization.

Methodology:
- Due to the large number of simulations (>400) most results are from an axisymmetric model.

Comparison of axisymmetric simulations and 3D simulations is shown in Fig. 11.
- Model: CM1
  - Domain: 1500 km x 25 km
  - Grid spacing: 1 km horizontal grid spacing, 123 vertical levels (17 levels below 1 km).
  - Microphysics: Morrison (2009) double-moment scheme
  - Horizontal and vertical turbulence schemes: same as Bryan and Rotunno (2009).
  - Intensity of horizontal diffusion is proportional to \( l_v \).
  - Intensity of vertical diffusion is proportional to \( l_h \).
- To allow for straightforward comparison with theory, surface enthalpy coefficient \( C_k \) is held fixed at 1.2 \( \times 10^{-3} \).
- Surface drag coefficient \( C_d \) is also held fixed for each simulation, but is varied from one simulation to another.

Method to determine analysis time
- hurricane size
- Comparison to 3D simulations
- Sensitivity to formulation of \( l_v \)
- Maximum Intensity
- Boundary-Layer Structure
- Estimated for Surface Exchange Coefficients and Turbulence Length Scales Using Numerical Simulations

### References
