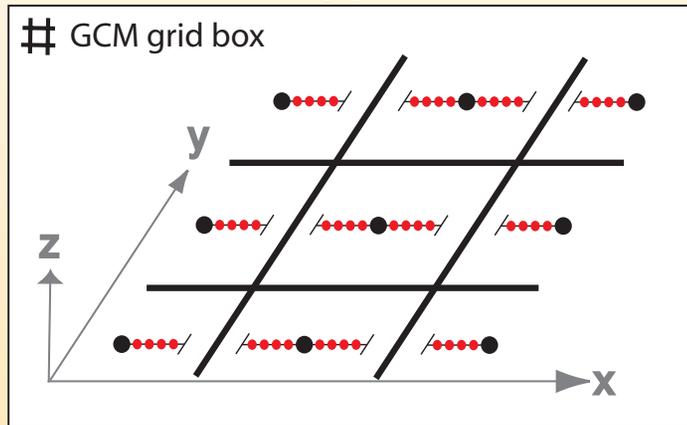


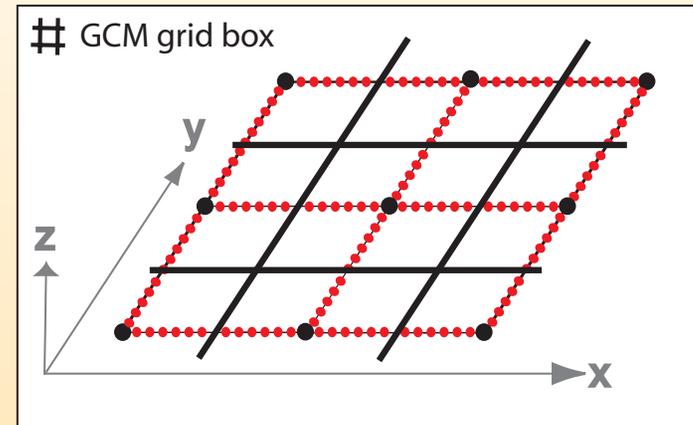
# Development of a Quasi-3D MMF

A method to simulate the statistics of 3D convective motion using basically 2D framework

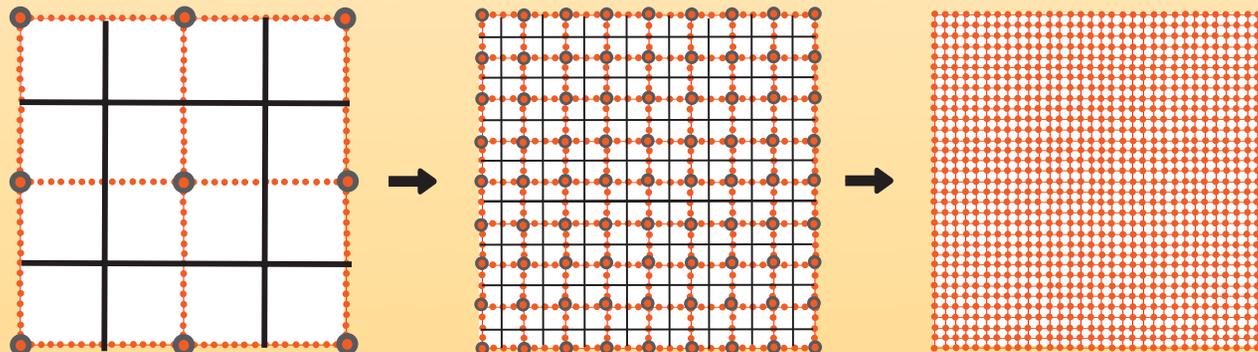
## Prototype MMF



## Quasi-3D MMF



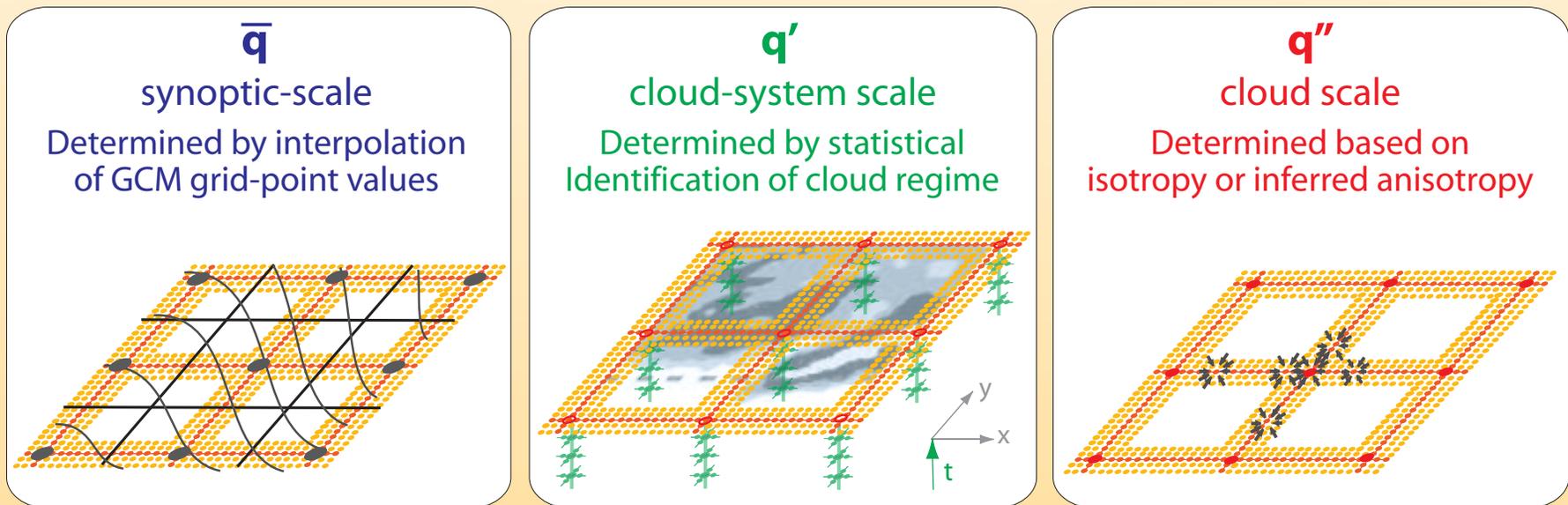
**The quasi-3D MMF converges to the 3D CRM as the GCM grid is refined.**



# Problems with the highly-anisotropic horizontal grid

- How to calculate the normal components of gradients at grid points other than intersections?
- How to mimic the 3D dynamics using basically 2D framework?
- How to maintain the stability of the algorithm?

**We introduce the multi-scale expression for variables.**

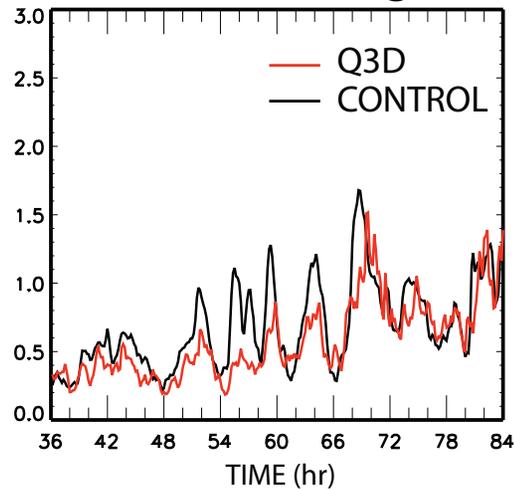


**A quasi-3D algorithm has been developed and tested.**

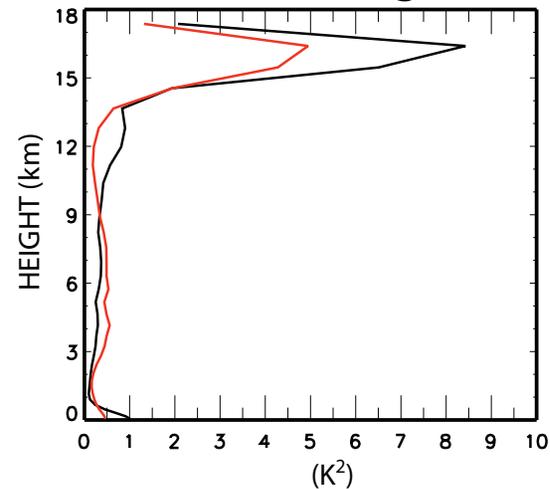
# An Example of Test Results

*Variance* of potential temperature

**Vertical Average**



**Time Average**



## What to do next?

- Refinement of the algorithm
- Expansion of the domain
- Coupling with an idealized GCM