SCIENCE IMPACT

Applications

The AMR dycore is a powerful tool with which to explore several computational and scientific issues related to multiscale climate modeling:

Tests of Tracer Transport with Idealized Physics in a Prescribed Flow

Goal: Explore AMR dycore’s ability to transport a tracer on a sphere with an evolving mesh at fine resolution

AMR with 3 tiers (80km→20km horiz. resolution)

32 vertical levels

Scenario: A simple surface flux of water vapor is advected in a Hadley cell flow field, and precipitates out as rain due a vertical temperature gradient.

(L) Simulation snapshot shows the tracer (water vapor in green/red shading) as it enters its second Hadley cell circuit. Rain (dark blue) has accumulated on the Earth surface. Fine-resolution areas track regions of large water vapor, indicating AMR is functioning correctly.

Well-suited to simulate non-stationary, intermittent, multiscale weather phenomena such as tropical cyclones, atmospheric rivers, and the MJO

REFERENCES AND ACKNOWLEDGEMENTS


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