



The impact of non-conservation of angular momentum in CAM-FV

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Finite-difference and finite-volume methods cannot guarantee simultaneous conservation of mass, energy and momentum. Usually the choice is made to sacrifice momentum. A case in hand is the FV dycore of CAM6, used also in a variety of other GCMs. A mismatch in the finite treatment of vorticity and divergence leads to numerical loss of axial angular momentum in the atmospheric circulation by a substantial fraction of the physical fluxes. A scheme has been devised to correct this problem in the zonal mean and has been implemented in CAM6. We present results on the consequences of reducing numerical angular-momentum for the global circulation in CAM6 simulations. These include a slow-down of the Hadly cell and reduced tropical precipitation, correcting significant systematic biases of the model.