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Assessment of tropical intraseasonal variability in versions 2 and 3 of the GFDL atmosphere model

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The depiction of tropical intraseasonal variability will be compared between Versions 2 and 3 of the GFDL Atmosphere Model (AM). Relative to AM2, AM3 utilizes a new treatment of deep and shallow cumulus convection and mesoscale cloud effects. The cumulus parameterization used in AM3 is a mass flux-based scheme but also, unlike many other general circulation models including AM2, incorporates convective-scale vertical velocities that play a key role in cumulus microphysical processes. The AM3 convection scheme allows water vapor and condensate generated within deep cumulus plumes to be transported directly into adjacent mesoscale cloud systems, which can strongly impact large-scale moisture and radiation fields. We will examine several multi-year simulations of AM2 and AM3 with constrained lower boundary conditions. Highlighted features of our analysis include the impacts of interactive and non-interactive evaporative fluxes on intraseasonal variability as well as the moist static energy budget of MJO disturbances.