



Differing impacts of resolution changes in latitude and longitude on the mid-latitudes in the LMDZ Atmospheric GCM

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We study the sensitivity of the LMDZ grid-point atmospheric GCM to changes in the resolution in latitude or in longitude, focusing on the mid-latitudes. In a series of dynamical-core experiments, increasing the resolution in latitude leads to a poleward shift of the jet, which also becomes less baroclinic, while the maximum eddy variance decreases. The distribution of the jet positions in time also becomes wider. On the contrary, when the resolution increases in longitude, the position and structure of the jet remain almost identical, except for a small equatorward shift tendency. An increase in eddy heat flux is compensated by a strengthening of the Ferrel cell. The source of these distinct behaviors is then explored in constrained experiments where the zonal-mean zonal wind is constrained towards a same reference state while the resolution varies.