



Influence of Atmospheric CO₂ Variation on Storm Track Behavior

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The storm tracks are the regions of strong baroclinicity where surface cyclones occur. The effect of increase with following decrease of anthropogenic load on storm tracks activity in the Northern Hemisphere was studied. The global climate system model of intermediate complexity ("Planet Simulator", Fraedrich K. et al., 2005) was used in this study. Anthropogenic forcing was set according to climatic scenario RCP8.5 continued till 4000 AD with fixed CO₂ concentration till 3000 AD and linear decrease of anthropogenic load to preindustrial value at two different rates: for 100 and 1000 years.

Modeling data analysis showed meridional shift of storm tracks due to atmospheric CO₂ concentration variation. When CO₂ concentration increases storm tracks demonstrate poleward shifting. When CO₂ concentration decreases to preindustrial value storm tracks demonstrate a tendency to equator-ward shifting. Storm tracks, however, don't recover their original activity and location to the full. This manifests itself particularly for "fast" CO₂ concentration decrease. Heat and moisture fluxes demonstrate the same behavior. In addition, analysis of eddy length scale (Kidston J. Et al., 2011) showed their increase at mid-latitudes and decrease at tropic latitudes due to intensive CO₂ concentration increase. This might cause poleward shift of mid-latitude jets.

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