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Effects of the baroclinic adjustment on the tropopause in the NCEP-NCAR reanalysis

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We study the mean tropopause structure from the NCEP-NCAR reanalysis in the framework of baroclinic adjustment theories, focusing on the impact of baroclinic eddies on the mean tropopause height. In order to measure the effects of such perturbations, we introduce an appropriate global index that selects events of high baroclinic activity and allows us to distinguish the phases of growth and decay of baroclinic waves. We then composite the tropopause mean structure before and after baroclinic events, finding that baroclinic disturbances cause the zonally averaged midlatitude winter tropopause height to rise. Our results establish the importance of baroclinic adjustment processes for midlatitude tropopause dynamics.