



The long-term trend of temperature and wind characteristics using MERRA reanalysis during different solar cycle phases

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This study is focused on the long-term trends of temperature and wind characteristics (zonal and meridional wind component) during different solar cycle phases in the troposphere, stratosphere and lower mesosphere. We analyze the interactions between tropospheric/stratospheric/exterrestrial phenomena, e.g. solar cycle, QBO, NAO or ENSO and temperature and wind characteristics using multiple linear techniques. The analysis was applied to the period 1979-2013 based on the current reanalysis data, including the MERRA reanalysis dataset (Modern Era Retrospective-analysis for Research and Applications) for pressure levels: 1000 – 0.1 hPa. We study trends and their statistical significance for zonal averages of temperature and wind components in the selected period to explain the influence of selected phenomena to the troposphere, stratosphere or lower mesosphere in the different solar cycle phases.