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## Response of tropospheric temperatures to solar variability detected in re-analysis, radiosonde, and MSU data

H. Gleisner and P. Thejll

Atmosphere Space Research Division, Danish Meteorological Institute, Copenhagen, Denmark (hgl@dmi.dk / Phone: 0045-39157484)

Analysis of NCEP/NCAR reanalysis data reveal strong and statistically significant responses of global-mean tropospheric temperatures to solar irradiance variations, whereas an identical analysis of the ERA40 re-analysis data show much weaker tropospheric responses. The NCEP results point out solar variability as one of the dominating forcing factors for climate on multi-annual to decadal time scales, whereas in ERA40 solar variability appears to play only a minor role for climate, particularly in the upper troposphere. In an attempt to resolve the divergent results obtained from the two re-analysis data sets we here compare the solar signals detected in the re-analysis data sets with those detected in gridded radiosonde data (HadRT) and in MSU data. The aim of the study is to confirm the existence of solar-variability effects in the lower atmosphere, to quantify and compare the sensitivities of the lower-atmosphere climate to solar variability as detected in the available climate data sets, and to identify the discrepancies between the two re-analysis data sets causing the divergent results.