

The use of MSU in climate change studies

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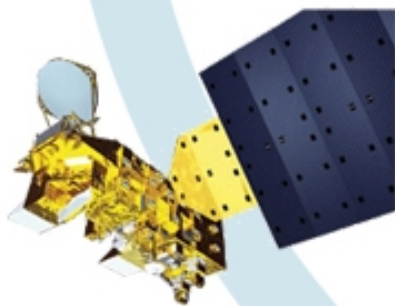
We briefly summarize our recent research using two independently produced MSU climate timeseries.

We illustrate the use of MSU products in attempts to resolve the observed discrepancy between a significant surface warming and little tropospheric temperature change within the tropics over the satellite period. This is contrary to climate model predictions of increasing warming aloft under anthropogenic forcings. We use MSU data both to inform and to test our hypothesis that this disagreement occurs because tropical tropospheric temperature evolution on climate timescales is a two-boundary problem with both surface and stratospheric constraints.

We also show how MSU data can be usefully used to inform us as to the potential causes of recent climate change. Space-time global optimal detection studies using a climate-model yield significant both natural and anthropogenic climate change signals within tropospheric MSU timeseries. This result is shown to be insensitive to the choice of MSU dataset within the mid to upper troposphere. For stratospheric temperatures our analyses imply that the model significantly overestimates the response - most likely because it has too much ozone reduction in comparison to recent observations.

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