

# **An Overview of OCTAV-UTLS (Observed Composition Trends and Variability in the UTLS), a SPARC Activity**

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The upper troposphere / lower stratosphere (UTLS) is affected by the Brewer Dobson Circulation (BDC) as well transport across the tropopause and the jets on a wide range of temporal and spatial scales. Potential impacts of long-term changes in dynamics or chemistry on UTLS tracer distributions are therefore difficult to detect, and recent work shows that UTLS ozone trends are still not well understood (e.g. Ball et al., 2018; Steinbrecht et al., 2017). Part of the uncertainty arises from the short term variability of tracers caused by planetary and synoptic waves inducing reversible excursions of the jets and the tropopause altitude. Variability of tracer distributions at the tropopause introduces a large uncertainty to estimates of future surface temperatures (Riese et al., 2012). It therefore essential to account for dynamically induced variability when looking at trends in dynamical processes such as STE or the BDC and assessing their effects on trace gas distributions and long-term composition changes.

The Stratosphere-troposphere Processes And their Role in Climate (SPARC) activity OCTAV-UTLS (Observed Composition Trends and Variability in the UTLS) aims to reduce the uncertainties in trend estimates by accounting for dynamically induced variability. Achieving these goals using existing UTLS trace gas observations from aircraft, ground-based, balloon, and satellite platforms requires a consistent analysis of these different data with respect to the tropopause or the jets. As a central task for OCTAV-UTLS, we are developing and applying common metrics, calculated using the same reanalysis datasets, to compare UTLS data using geophysically-based coordinate systems including tropopause and upper tropospheric jet relative coordinates. The central tool to achieve these goals is JETPAC (Jet and Tropopause Products for Analysis and Characterization, *Manney et al*, 2011), which provides a consistent analysis across the different measurement platforms and sampling properties of the different types of observations. OCTAV-UTLS will also assess gaps in current geographical / temporal sampling of the UTLS that limit our ability to determine atmospheric composition variability and trends. This talk will provide an overview of the OCTAV-UTLS activity and examples of initial calculations of geophysically-based coordinates and comparisons of remapped data.

## **References**

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