

How is extratropical Ozone influenced by the QBO in CCMi model data?

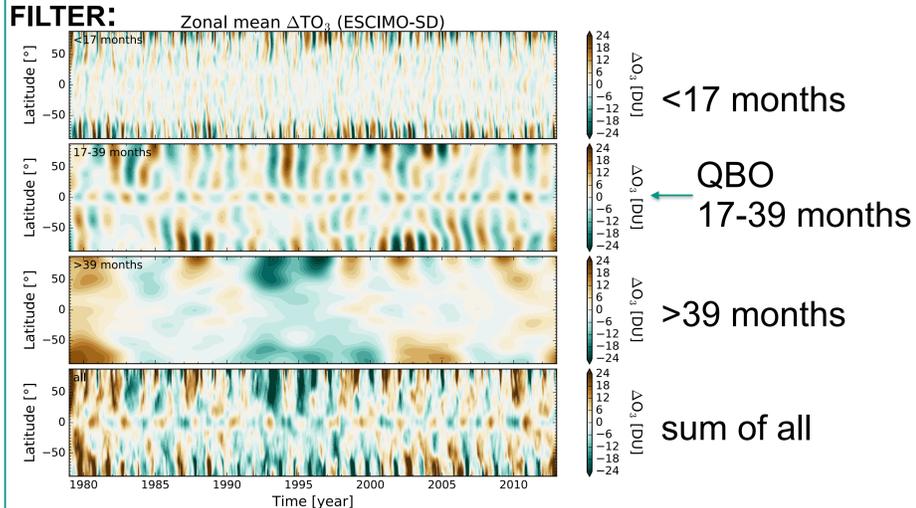
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1. MOTIVATION

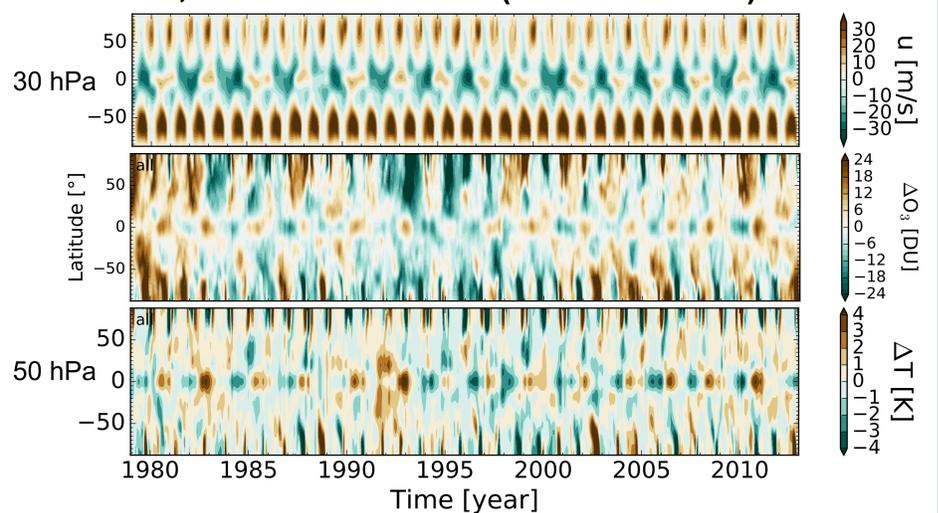
For the detection of small trends in ozone a reliable attribution of variability is required. The interannual ozone variability is influenced by the quasi-biennial oscillation (QBO) in the tropical stratospheric zonal mean zonal winds. The effect on ozone in sub-tropical and mid-latitude regions is studied using CCMi model data with a Fourier bandpass filter to extract the QBO signature in ozone. Using the detected QBO signatures we construct latitude-height cross-sections of ozone mixing ratios and temperature anomalies to reveal the vertical structure of QBO related changes. With the ozone anomalies induced by the residual circulation we improve our understanding of the physical mechanisms that contribute to ozone variability and we can thus detect residual long-term trends in tropical ozone with more confidence.

2. METHOD: SEPARATION OF THE TOTAL COLUMN OZONE SIGNAL INTO THREE DIFFERENT REGIMES USING A FOURIER BAND PASS

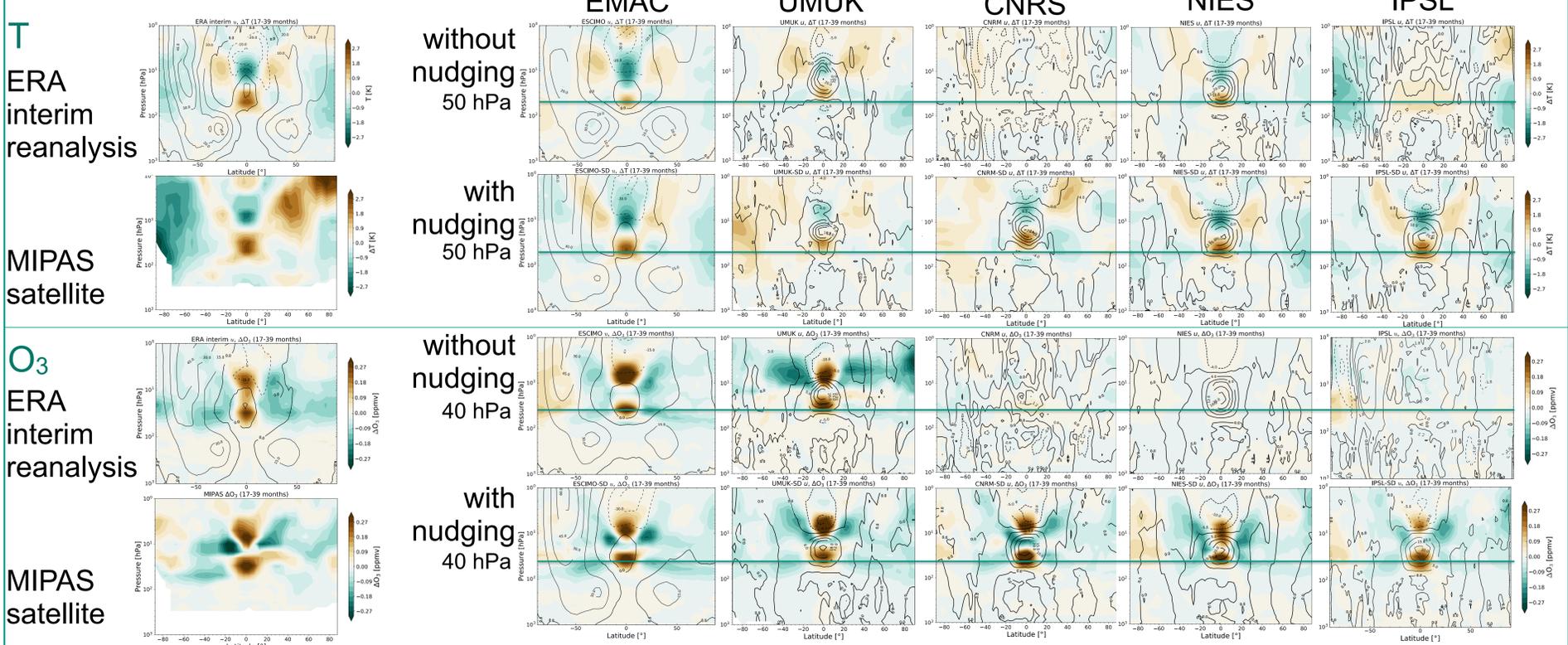
FILTER:



TIME SERIES OF FILTERED (QBO) Δ TOTAL COLUMN OZONE, T' AND U' FOR DATA (EMAC NUDGED)



3. COMPOSITES IN T'/Δ OZONE MAXIMUM



5. SUMMARY

1. Annual cycle of ozone/T shows good agreement between datasets (not shown).
2. Influence of the wind QBO on ozone and temperature is clearly observed in the EMAC model.

3. Ozone maxima and minima extend to 12 to 15°N/S.
4. Quadrupole-like structure of the ozone field.
5. The observed structures in ozone and temperature are related to the residual circulation and the dynamically and chemically controlled regimes of ozone.

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