Evaluation of the Ozone Fields in NASA’s MERRA-2 Reanalysis

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Rationale: Assimilating Ozone in MERRA-2

Reanalysis ozone should be recognized as a useful tool for scientific studies

Guiding principles
1. Achieve a faithful representation of ozone fields, particularly in the Upper Troposphere – Lower Stratosphere
2. When possible use the best data available but...
3. Avoid too many temporal discontinuities
4. It is more important to get the variability right than to minimize biases
5. Validate the product: it does not have to be perfect but it will be useful if its uncertainties are quantified

Summary: Usefulness for Science

- Comparisons with satellite data: difference standard deviations within 20% above 100 hPa and within 10% in the middle stratosphere
- Ozone sondes: good representation of variability in the lower stratosphere (LS)
- Representation of LS variability improves in the Aura period
- Upper tropospheric ozone has a low bias in the Aura period but exhibits high correlations with ozone sondes
- MERRA-2 ozone has already been used in several recent scientific studies

Reference