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The Aura Mission: Measurements, Validation Plan and Synergies with NDSC.

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Abstract

Global atmospheric measurements to be obtained after 2003 by the instruments aboard the Aura satellite are described, in anticipation of significant overlap with observations from the Network for Detection of Stratospheric Change (NDSC).

Aura will be in a sun-synchronous polar orbit, with 4 instruments aboard: the High Resolution Dynamics Limb Sounder (HIRDLS), measuring infrared emission profiles from high resolution atmospheric limb scans behind Aura, the Microwave Limb Sounder (MLS), obtaining limb emission profiles ahead of the satellite, the Ozone Monitoring Instrument (OMI), a nadir-viewing UV-VIS imaging spectrometer with high spatial resolution, and the Tropospheric Emission Spectrometer (TES), a Fourier Transform infrared spectrometer measuring in both the nadir and the limb mode (behind Aura).

The main products from Aura will be:

(1) Stratospheric profiles of temperature, O₃, H₂O, OH, HO₂, CH₄, CO, HCN, CH₃CN, N₂O, HNO₃, NO_x, N₂O₅, HCl, ClO, ClONO₂, HOCl, CF₂Cl₂, CFCl₃, and BrO (2) tropospheric profiles of temperature, O₃, H₂O, CH₄, CO, and HNO₃ (with NO_x, HCN in the upper troposphere), (3) Column densities of O₃, NO₂, HCHO, BrO, OClO, (4) aerosol extinction and optical thickness, (4) cloud information, (5) volcanic SO₂.

We review the observation sampling expected from the Aura instruments, along with correlative measurement priorities, in the context of expected NDSC observations. In addition to the stratospheric observations from NDSC sites, correlative observations of interest to Aura investigators include observations of tropospheric constituents under a variety of conditions, including pollution episodes (for O₃, CO, CH₄, and NO₂ in particular). Long-term validation needs for satellite missions can best be addressed by networks such as NDSC.

Topic: 6- Satellite data calibration and/or validation