TRENDS IN ATMOSPHERIC COMPOSITION FROM THE ATMOSPHERIC CHEMISTRY EXPERIMENT (ACE) SATELLITE

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After almost 18 years in low-Earth orbit, the ACE satellite is making near-real time measurements of numerous trace gases, thin clouds, aerosols and temperature by solar occultation. The primary instrument is a high-resolution (0.02 cm^{-1}) infrared Fourier transform spectrometer (FTS) operating in the 750–4400 cm^{-1} region, which provides data for the vertical distribution of trace gases.

Our current version of ACE-FTS processing, v.4.1, retrieves an unprecedented 44 molecules (H_2O, O_3, N_2O, NO, NO_2, HNO_3, N_2O_5, H_2O_2, HO_2NO_2, O_2, N_2, SO_2, HCl, HF, ClO, $ClONO_2$, CFC-11, CFC-12, CFC-113, COF_2, $COCl_2$, COFCl, CF_4, SF_6, CH_3Cl, CCl_4, HCFC-22, HCFC-141b, HCFC-142b, HFC-134a, HFC-23, CO, CH_4, CH_3OH, H_2CO, HCOOH, C_2H_2, C_2H_6, OCS, HCN, $CH_3C(O)CH_3$, CH_3CN, PAN ($CH_3C(O)OONO_2$), high and low altitude CO_2 as well as 24 additional isotopologues. ACE monitors the Montreal Protocol on substances that deplete the ozone layer, and all of the main greenhouse gases, including CO_2. Altitude-latitude distributions and trends in atmospheric abundance will be presented for a subset of the ACE molecules including new research retrievals for HOCl. See http://www.ace.uwaterloo.ca for more information.