

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

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After almost 17 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 $750\text{--}4400\text{ cm}^{-1}$ region, which provides data for the vertical distribution of trace gases.

Our current version of ACE-FTS processing, v.4.0 (soon to be 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 , $\text{CH}_3\text{C}(\text{O})\text{CH}_3$, CH_3CN , PAN ($\text{CH}_3\text{C}(\text{O})\text{OONO}_2$), 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. See <http://www.ace.uwaterloo.ca> for more information.