

OBSERVATIONS OF N_2O_5 AND NO_3 IN AMBIENT AIR VIA CONTINUOUS-WAVE CAVITY RING-DOWN SPECTROSCOPY

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The nitrate radical, NO_3 , and its related reservoir compound, dinitrogen pentoxide, N_2O_5 are important intermediates in atmospheric chemistry. The nitrate radical reacts reversibly with nitrogen dioxide to form dinitrogen pentoxide, and these three compounds are thought to be equilibrated in the ambient atmosphere. These molecules act as intermediates between NO_x (NO and NO_2) and nitric acid. The nitrate radical, due to its strong visible absorption bands in the red, has been measured in the ambient atmosphere via long-path spectroscopy. Recently, cavity ring-down spectroscopy has been used to measure NO_3 in-situ, also affording detection of N_2O_5 via thermal dissociation to NO_3 at 80°C . We have applied continuous-wave CRDS to detect these compounds in ambient air. This technique will be discussed. We report observations of N_2O_5 in Fairbanks, AK during wintertime. Atmospheric implications of the observations are also discussed.