Limits on Particulate Nitrate Contribution to NOy Budget During the MIRAGE Campaign.

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A large complement of NOy constituent species were measured onboard the C-130 during the MIRAGE-Mex campaign, as well as total NOy. NOy, NO and NO2 were measured from a downward facing inlet cut at 45 degrees towards aft, using a chemiluminescence technique. The sum of component gas-phase species which are expected to be the most significant contributors to NOy; NO, NO2, HNO3 and PANs (as PAN, PPN, PiBN, MPAN, APAN, PBzN, MoPN) at times fall short of measured NOy values. The discrepancy during the higher aerosol portions of flight on 0310 is 20% to 40% of NOy. The NOy budget is described in detail in a companion poster by Weinheimer et al. During several flights, good correlations between the deficit NOy and AMS aerosol nitrate (AN) measurements suggest that the NOy instrument sampled some fraction of the AN aerosol and therefore, at times did not provide an exclusively gas-phase NOy measurement. When sampled, aerosol nitrate as ammonium nitrate is readily decomposed and reduced in the heated gold catalytic converter of the NOy instrument.