**Measurements of Reactive Nitrogen Oxides**

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During the 2006 MILAGRO campaign in Mexico City, researchers from UC Berkeley will be making continuous, *in situ* ground-based measurements of reactive nitrogen oxides at the T1 site at Tecamac. We will be operating two thermal dissociation-laser induced fluorescence (TD-LIF) instruments to measure several classes of $NO_y$.

I. TD-LIF measurements of $NO_2$, ∑peroxy nitrates, ∑alkyl nitrates and $HNO_3$

One instrument uses LIF to measures $NO_2$ radicals. A 408 nm diode laser is used to excite $NO_2$, and the resulting fluorescence is detected by photo-multiplier tubes in single photon counting mode. Certain classes of $NO_y$ thermally dissociate to $NO_2$ and an accompanying radical at a characteristic temperature. We flow sample air through heated ovens before $NO_2$ detection, allowing us to also determine total peroxy & peroxy acyl nitrates (∑PNs), total alkyl and multifunctional alkyl nitrates (∑ANs), and $HNO_3$. $NO_2$ participates in ozone production and tropospheric photochemistry. ∑PNs act as reservoir species, removing $NO_x$ from the atmosphere and enabling transport over great distances, while $HNO_3$ acts as a sink for $NO_x$ due to rapid deposition to surfaces. The role of ∑ANs in urban air quality is less well understood, though these compounds act are indicative of the particular VOC that contribute to ozone production.

II. TD-LIF measurements of $NO_3$ and $N_2O_5$

A second instrument uses LIF at 662nm to measure $NO_3$ radicals; as $N_2O_5$ thermally decomposes at a temperature characteristic of its bond energy, this instrument is also used to measure $N_2O_5$. $NO_3$ is a key night-time oxidant and, with $N_2O_5$, is an intermediate species to $NO_x$ removal processes. Nighttime chemistry thus determines the extent to which $NO_x$ accumulates locally and is transported regionally.