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## Aircraft Measurement of HONO Vertical Profiles over a Forested Region

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A number of field campaigns have recently reported high concentrations of nitrous acid (HONO), which upon photolysis contributed significantly to the production of OH radicals, a primary oxidizing species in the atmosphere. All the measurements up to date have been ground-based and no information on HONO vertical distributions above boundary layer is available in literature. Here we presented the first vertical concentration profiles of HONO in the troposphere, measured on a small aircraft platform. Measurements were conducted over the northern tip of the lower peninsula of Michigan from July 30, 2007 to August 6, 2007. The mixing ratio of HONO ranged from 4-80 pptv at the altitude of 0.05-2.7 km over the forested region, while HONO mixing ratio from 10-40 pptv at the altitude of 0.07-1.2 km above the lake area respectively. The HONO distribution patterns were strongly correlated to the temperature profiles, i.e., strong negative gradient existed in stable boundary layer in the morning hours, and relatively uniform distribution in the unstable and well-mixed boundary layer in the afternoon. This suggests that ground surfaces were the major sources of HONO in the boundary layer. In the free troposphere where surface influence is negligible, the processes occurring on aerosol surfaces may be responsible for the in situ production of HONO. At the observed concentration of about 10 pptv in the free troposphere, HONO may be an important intermediate in re-NO<sub>x</sub>-ification process.