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## Tropospheric ozone sources and wave activity over Mexico City and Houston during MILAGRO/Intercontinental Transport Experiment (INTEX-B) Ozonesonde Network Study, 2006 (IONS-06)

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**Abstract.** During the INTEX-B (Intercontinental Chemical Transport Experiment)/ MILAGRO (Megacities Initiative: Local and Global Research Observations) experiments in March 2006 and the associated IONS-06 (INTEX Ozonesonde Network Study; <http://croc.gsfc.nasa.gov/intexb/ions06.html>), regular ozonesonde launches were made over 15 North American sites. The soundings were strategically positioned to study inter-regional flows and meteorological interactions with a mixture of tropospheric O<sub>3</sub> sources: local pollution; O<sub>3</sub> associated with convection and lightning; stratosphere-troposphere exchange. The variability of tropospheric O<sub>3</sub> over the Mexico City Basin (MCB; 19° N, 99° W) and Houston (30° N, 95° W) is reported here. MCB and Houston profiles displayed a double tropopause in most soundings and a subtropical tropopause layer with frequent wave disturbances, identified through O<sub>3</sub> laminae as gravity-wave induced. Ozonesondes launched over both cities in August and September 2006 (IONS-06, Phase 3) displayed a thicker tropospheric column O<sub>3</sub> (~7 DU or 15–20%) than in March 2006; nearly all of the increase was in the free troposphere. In spring and summer, O<sub>3</sub> laminar structure manifested mixed influences from the stratosphere, convective redistribution of O<sub>3</sub> and precursors, and O<sub>3</sub> from lightning NO. Stratospheric O<sub>3</sub> origins were present in 39% (MCB) and 60% (Houston) of the summer sondes. Comparison of summer 2006 O<sub>3</sub> structure with summer 2004 sondes (IONS-04) over Houston showed 7% less tropospheric O<sub>3</sub> in 2006. This may reflect a sampling contrast, August to mid-September 2006 instead of July-mid August 2004.

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