Geophysical Research Abstracts
Vol. 13, EGU2011-9613, 2011
EGU General Assembly 2011

Ozone profile observations in Houston, Texas (1994 - 2010) from aircraft, balloons, and satellites

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Houston, Texas has long been an urban area plagued with high levels of surface ozone, particularly in spring and late summer. The combination of a large commuter population and one of the largest concentrations of petrochemical plants in the world results in abundant and nearly co-located sources of NO_x and hydrocarbons. The location of Houston on the South Coast of the United States in a subtropical climate results in meteorological conditions that favor ozone production. Using MOZAIC (1994 - 2004), ozonesonde (2000, 2004 - 2010), and TES (2005 - 2010) data, we examine the evolution of ozone profiles over Houston during a period in which various strategies have been implemented to alleviate the ozone pollution problem. Using meteorological data from associated soundings and analyses, we identify and evaluate influences on the ozone profiles from natural and anthropogenic sources, as well as local and remote sources. We further investigate how these various influences have changed with time.