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# What determines the HONO daytime source? First results from field measurements in south west Spain.

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Tropospheric nitrous acid (HONO) undergoes rapid photolysis to OH and NO during daytime and is thus known to be an efficient OH source in the early morning hours. A photostationary state (PSS) is established, involving the well-known reaction of OH with NO as source and photolysis (HONO + h$\nu$ $\rightarrow$ OH + NO) and the reaction OH + HONO $\rightarrow$ H2O + NO2 as well-known loss processes. An unexplained daytime source sustains HONO levels above this PSS and thus serves as an additional OH source even during day. The unexplained daytime sources are an ongoing topic in field and laboratory research.

All quantities necessary to calculate the PSS and quantify the daytime source were measured during the Diel Oxidant Mechanism In relation to Nitrogen Oxides (DOMINO) campaign. Measurements took place from mid November to mid Dezember 2008 at the Atmospheric Sounding Station- El Arenosillo of the Spanish National Institute for Aerospace Technology (INTA) 600m from the coast in a forested area about 20m above sea level, close to Huelva in the south west of Spain (37° 5" N and 6° 44' W).

HONO mixing ratios calculated from the PSS are compared to the values measured by a wet chemical technique, the LOng Path Absorption Photometer, LOPAP (QUMA, Wuppertal). Observed HONO mixing ratios were found to always exceed the calculated ones considerably, thus HONO is an important primary OH source during the whole day at this site. The required daytime source to sustain measured levels is analyzed regarding its dependence on physicochemical factors like radiation, temperature and relative humidity. The analysis comprises quite different pollution regimes, including clean marine air with HONO mixing ratios around the detection limit of 2 ppt and local pollution up to 260ppt during daytime.

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