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Investigation of the photo stationary state of NO_x during the PARADE field experiment using a novel Gas Analyzer for Nitrogen Dioxide Applying Laser-induced Fluorescence

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Here we present an investigation of the photostationary state (PSS) between NO and NO_2 using measurements of NO_2 performed during PARADE with a new Gas Analyzer for Nitrogen Dioxide Applying Laser-induced Fluorescence (GANDALF). The focus of PARADE, a collaboration between different German research institutes, is to investigate the summertime emissions and photochemistry in a semi-remote environment. Field measurements took place in summer 2011 at the Taunus Observatory, located on the Kleiner Feldberg in southwestern Germany. The measurement site is surrounded by forest with biogenic emissions in summer and influenced by anthropogenic sources from nearby large cities and highways. A comprehensive set of measurements of several important trace species and meteorological parameters were carried out during PARADE, including three different in-situ measurement techniques for NO_2, namely LIF, TD-CRD and a blue light converter/CLD. Being the first deployment of GANDALF this opportunity provided the means for a detailed comparison. Further we present the characteristics of the PSS observed in different chemical regimes observed for different wind directions during the campaign and compare the results with chemical box model simulations constrained by measurements.