

## O4-04 DETERMINATION OF NO AND NO<sub>2</sub> AIRCRAFT EMISSION INDICES AT AIRPORTS BY OPEN-PATH DOAS

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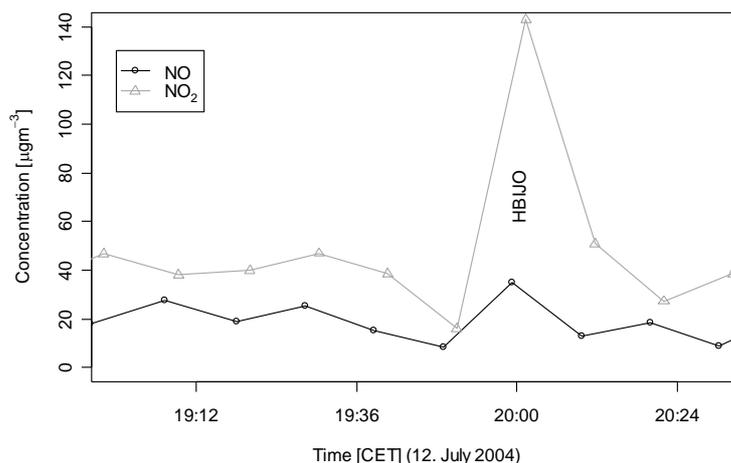
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Emission indices for NO<sub>x</sub> and CO are listed for each engine in a data base of the International Civil Aviation Organisation (ICAO) for four different thrust levels (idle, approach, cruise and take-off). But real emissions of aircraft at airport are not well known. These emissions are to be determined for different operational scenarios.

A method to determine emission indices of aircrafts is used, where concentration measurements of CO<sub>2</sub> together with other pollutants within the aircraft exhaust plumes are needed. During intensive measurement campaigns, concentrations of CO<sub>2</sub>, NO, NO<sub>2</sub> and CO were measured. The measurement techniques were Differential Optical Absorption Spectroscopy (DOAS) for NO and NO<sub>2</sub> as well as Fourier-Transform-Infrared (FTIR) spectrometry for CO<sub>2</sub> and CO. The advantage of these methods is that no operations on the airport are influenced during measurement times. Knowing the emission index of CO<sub>2</sub> from total combustion of kerosene the emission indices of the other compounds can be determined with the concentration measurements. Together with detailed observations of taxiway movements real in use emissions become available.

Field studies were conducted on two airports (Zurich airport ZRH and Budapest international airport BUD). The two studies focused on the emission rate estimation of CO and NO<sub>x</sub>. The results are presented here as well as a comparison with ICAO emission indices.



**Fig. 1: An example of NO<sub>x</sub>- measurements at the airport Zurich. The string (HBIJO) shows the time of an aircrafts passing the measurement path and leading to enhanced concentrations.**