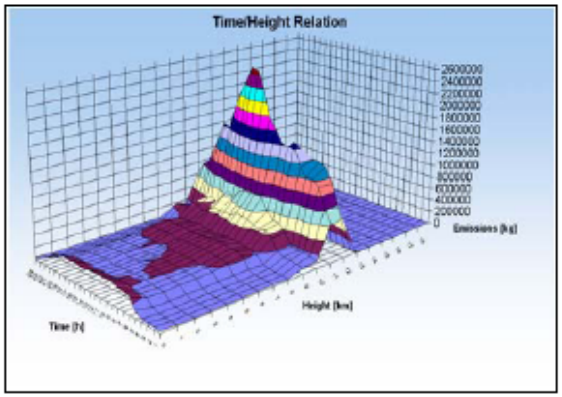
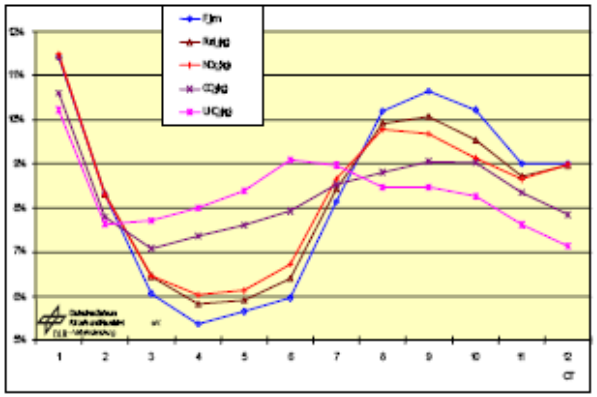
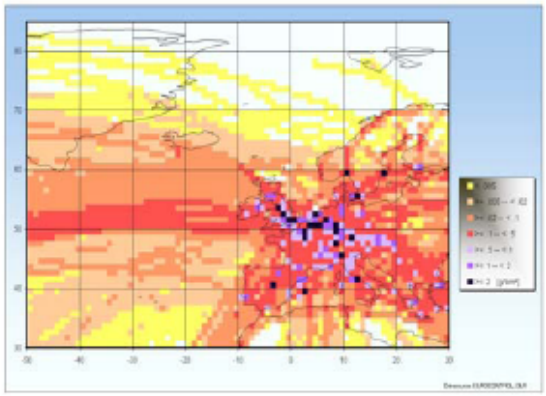
Emission of fuel in relation to time and height (1h x 1km)
of an **European inventory** on 21.7.98



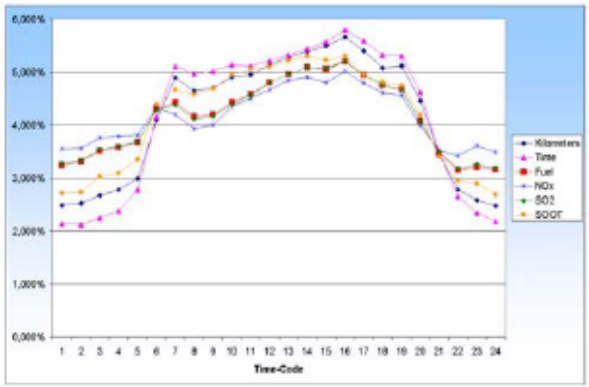
Percentages of characteristical figures of a **global inventory**
within the cycle steps (2h) of an average day in March 1992



SOOT-Emission [g/km2] vertically integrated; 21. July 1998;



Percentages of characteristical figures of an **European inventory**
within the cycle steps (1h) of an average day from 22.6. - 26.7.98



DLR, Air Transport and Airport Research

The 4D-Calculation Model FATE

Although the emissions of air traffic form just a small part of the total pollutant emissions,- e.g. earth-bound traffic, industry, private households - their importance for the environment is essential. The old, great-circle-based calculation methods are often not applicable any more, due to altered requirements. More and more frequently there are requirements for mapping the actual trajectory as good as possible in space and time.
Particularly for scientific research, besides consideration of further emission substances, a better local as well as an additional time-related identification of emission data is required. This 4-dimensional coding allows for example display of emissions during daytime and eventual effects by sun-exposure regarding chemical reactions. The first calculation model, meeting these requirements, was designed in DLR. FATE (Four-dimensional calcualtion of Aircraft Trajectories and Emissions) allows the point-precise calculation of the trajectory and enables time coding of the figures considered. The requirement of these applications is proved by multiple-use during the design phase.