Environmental Sensing and Modeling: Air Quality Data Analysis

Technical University of Munich

TUM Department of Electrical and Computer Engineering

Professorship of Environmental Sensing and Modeling

Group 15

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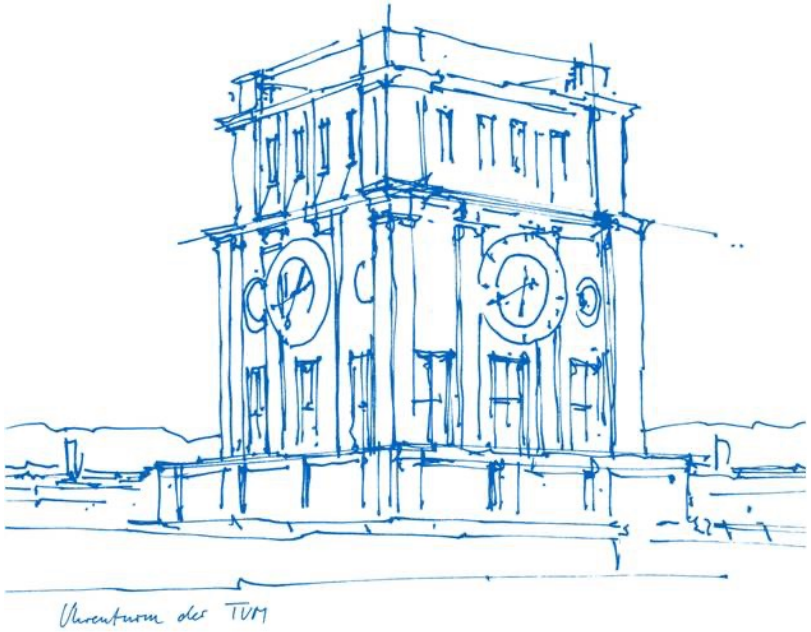
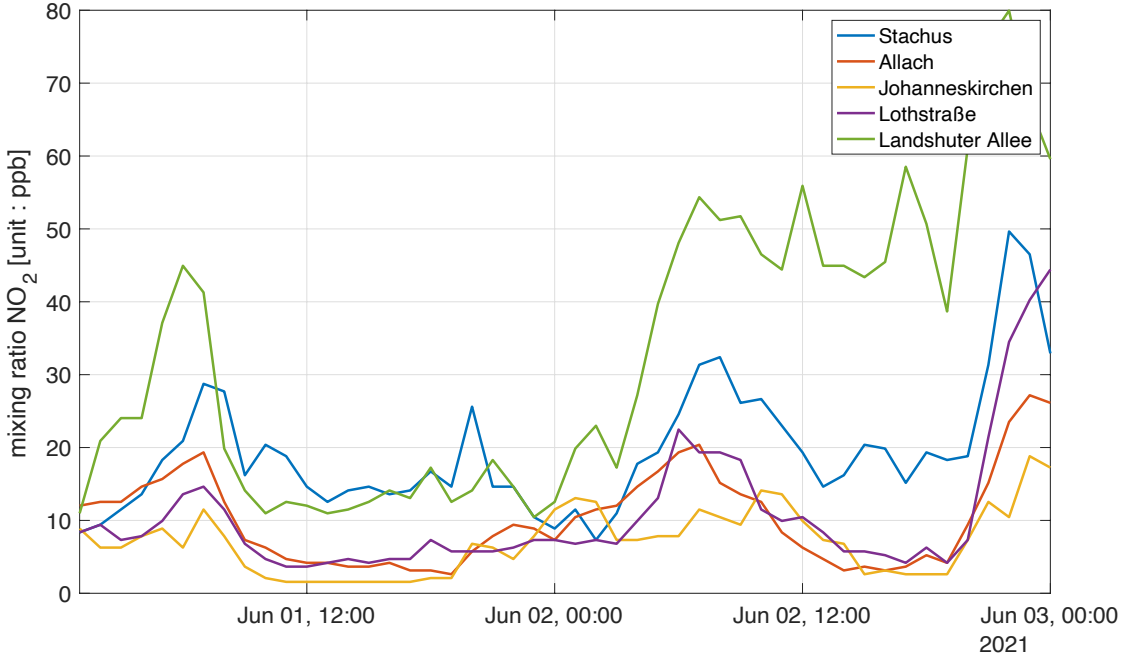


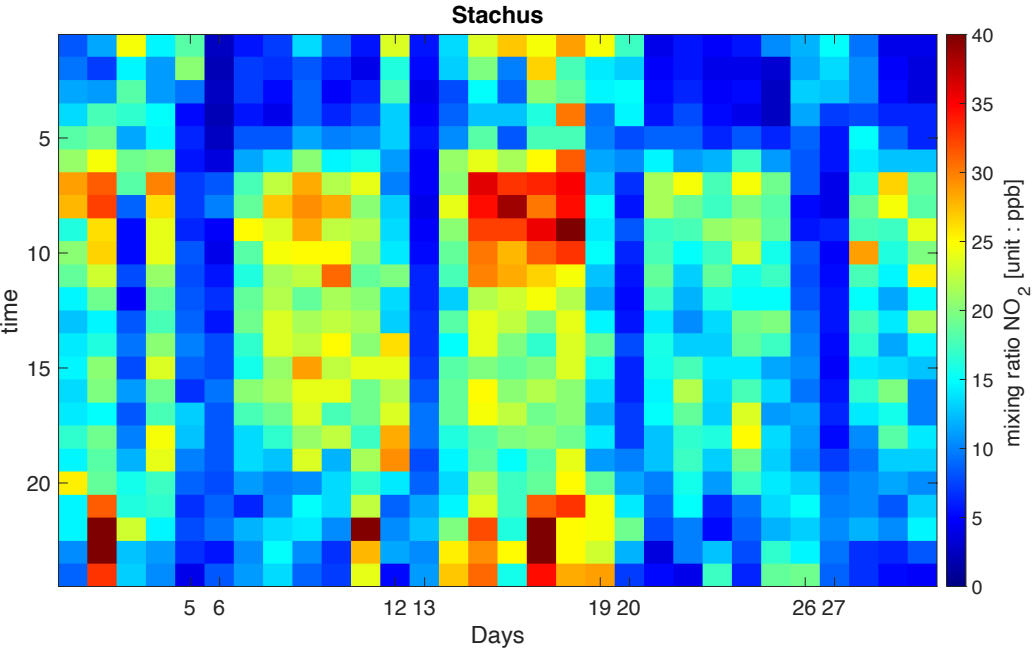
Exercise 1.3

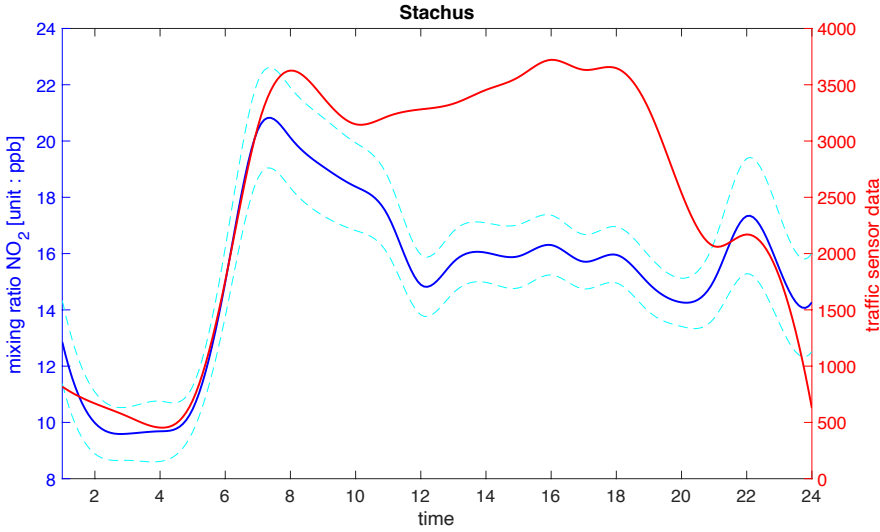

mixing ratio NO_2 [unit : ppb]
0
10
20
30
40
50
60
70
80
Jun 01, 12:00
Jun 02, 00:00
Jun 02, 12:00
Jun 03, 00:00
2021
Stachus
Allach
Johanneskirchen
Lothstraße
Landshuter Allee

Motivation for using the data of 30 days (June 2021)

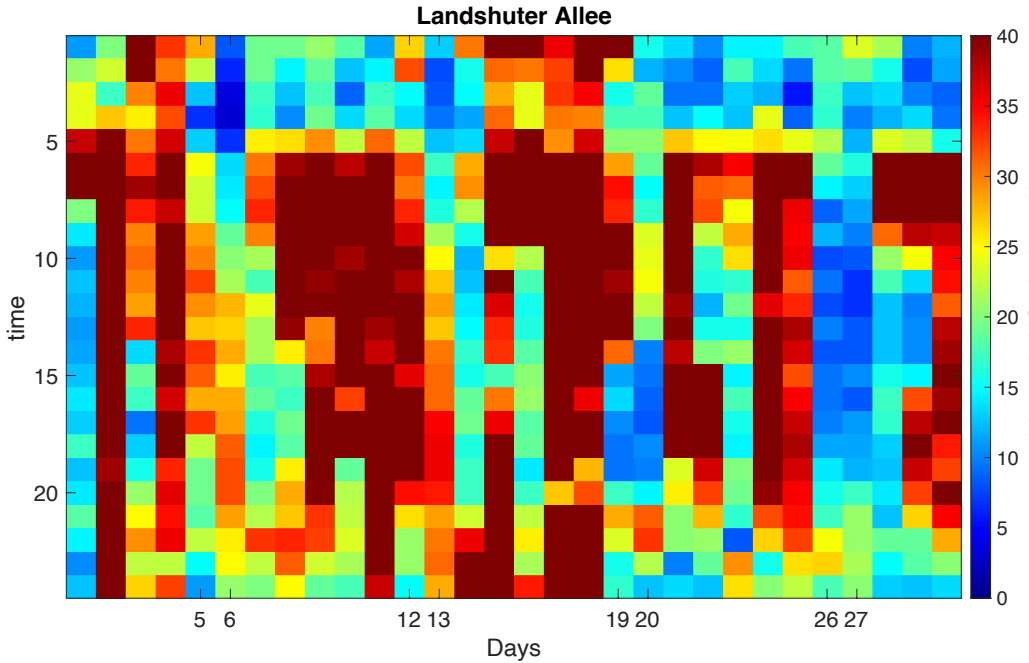
- Goal : investigate the daily cycle and the differences between the sites.
- Limited traffic data
- Traffic information may change from day to day, on weekends etc.
- would be wrong to make inferences just by looking at the last 48 hours of data -> work with a larger dataset

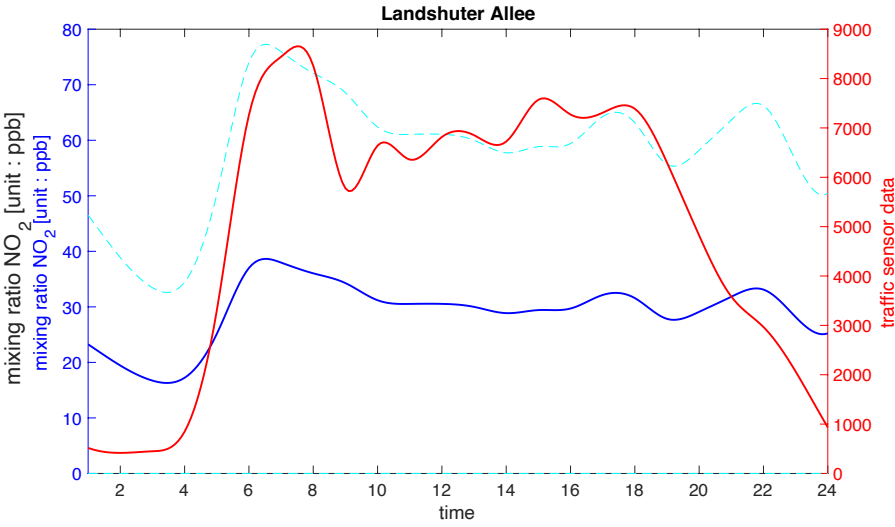
June 2021 - Stachus



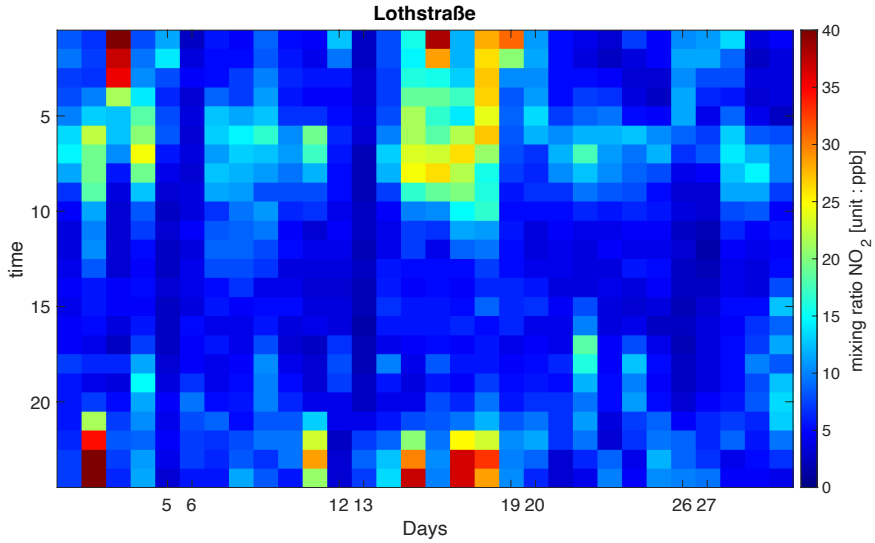


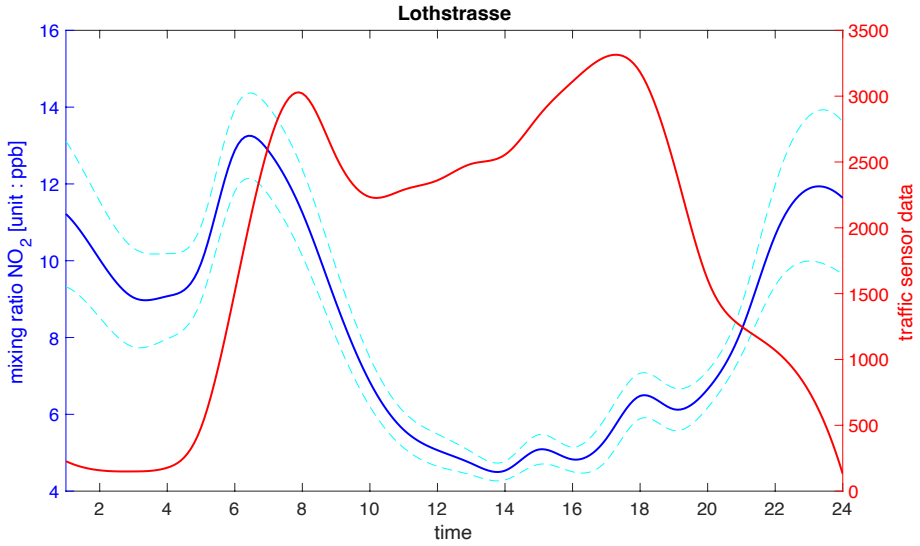
June 2021 – Landshuter Allee





June 2021 - Lothstraße



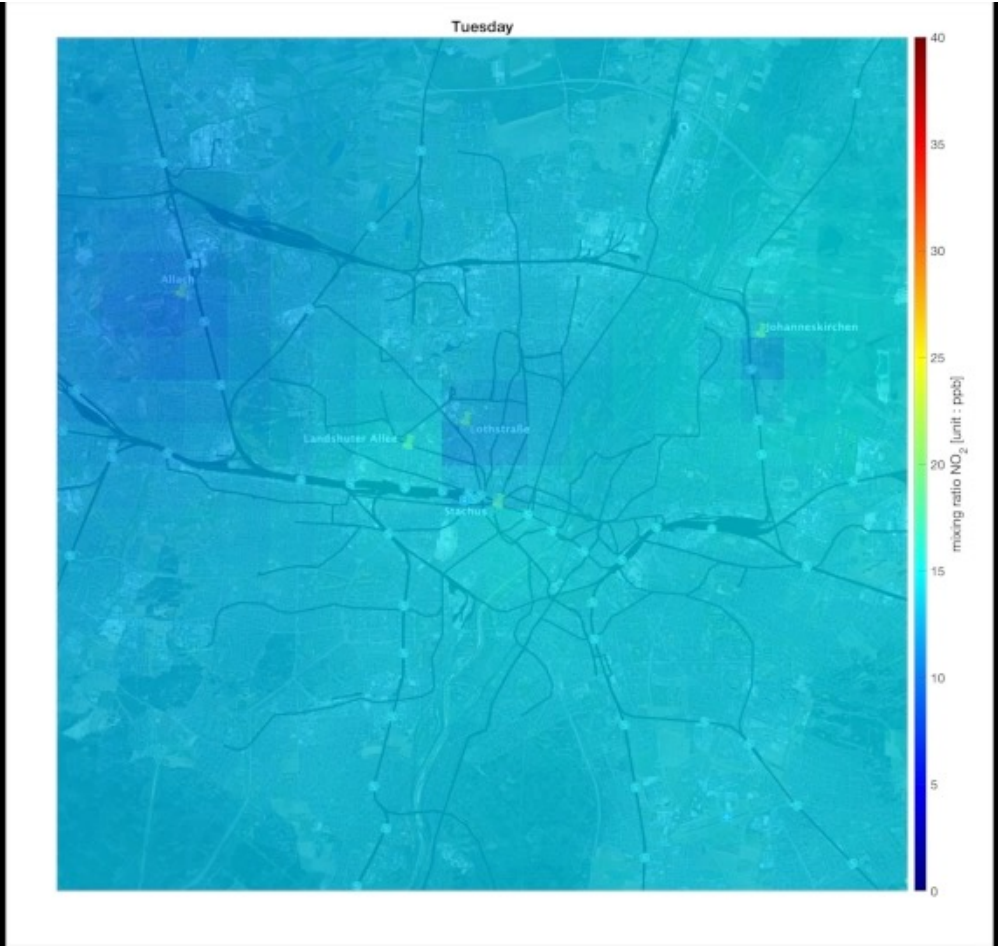


Daily cycle and Differences

- Compare weekdays – weekends
- High traffic -> high mixing ratio
- Intensity of the mixing ratio between 6am and 6pm
- June, 27th
- LHA realy really high
- Lothstraße really interesting
- Phenomenon in the night June 2nd and third week

Plotting the concentration map and overlaying it with a map of the city

- Do this for each day in June -> create an animation
- Problem: Station ‘Johanneskirchen’ has a far higher or far lower mixing ratio than its neighbors
- Solution: filter the 20x20 matrix with a Gaussian filter to smooth it


Tuesday
Allach
Johanneskirchen
Landshuter Allee
Lothstraße
Stachus
mixing ratio NO_2 [unit : ppb]
40
35
30
25
20
15
10
5
0

Sources

https://www.lfu.bayern.de/luft/immissionsmessungen/messwerte/stationen

https://www.lfu.bayern.de/luft/immissionsmessungen/doc/lueb_dokumentation/aktiv/01_Oberbayern/07_muenchen_allach.pdf

https://www.dwd.de/DE/Home/home_node.html