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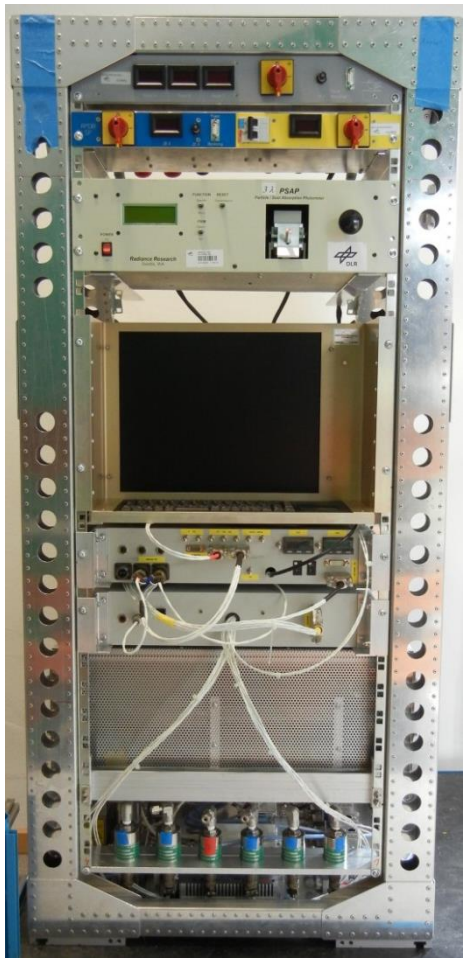
Aerosol microphysical properties for selected case studies during the EMeRGe-EU and EMeRGe-Asia campaigns

Jennifer Wolf[1], Daniel Sauer[1], Lisa Eirenschmalz[1], Theresa Klausner[1], Anna Beata Kalisz Hedegaard[1,2], Andreas Hilboll[2] and Hans Schlager[1]

[1] DLR-IPA, Germany
[2] IUP-Bremen, Germany

Set-up of the measurement instrument AMETYST

- **Condensation Particle Counters (CPC)**
  - Total Aerosol Concentration (~10 nm - 3µm)
- **Differential Mobility Analyzer (DMA) + CPC**
  - Scans between 10 - 300 nm for defined diameters
- **Optical Particle Counters (OPC)**
  - Total Aerosol Concentration (250 nm-3 µm, 16 channels)
- **3λ-PSAP**
  - Absorption coefficient at wavelength 467 nm, 530 nm and 660 nm for the total Aerosol



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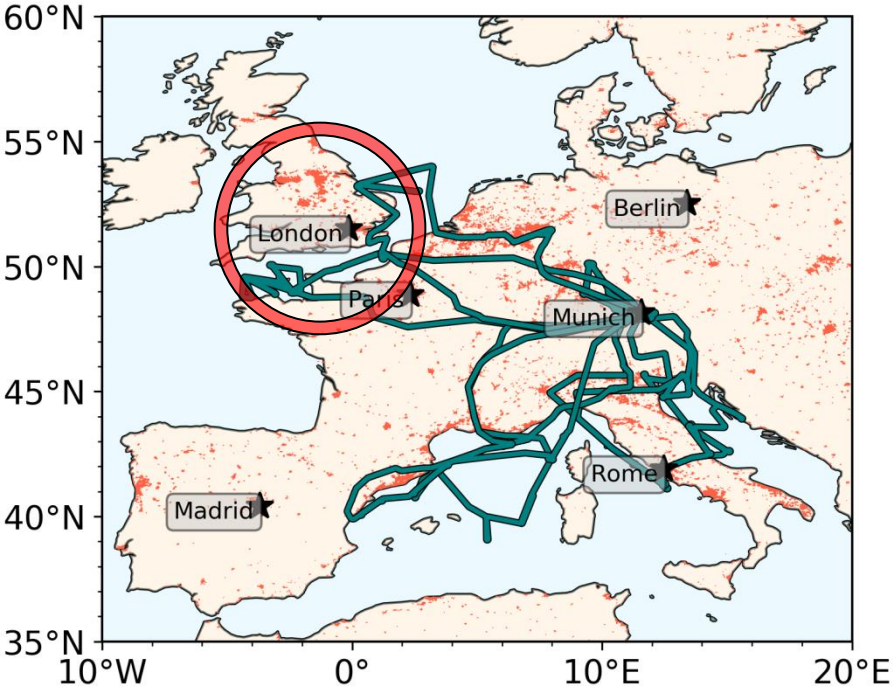
EMeRGe

Effect of **Me**gacities on the Transport and the Transformation of Pollutants on the **R**egional to **G**lobal Scal**e**s

EMeRGe-EU

11.07.2017 – 28.07.2017

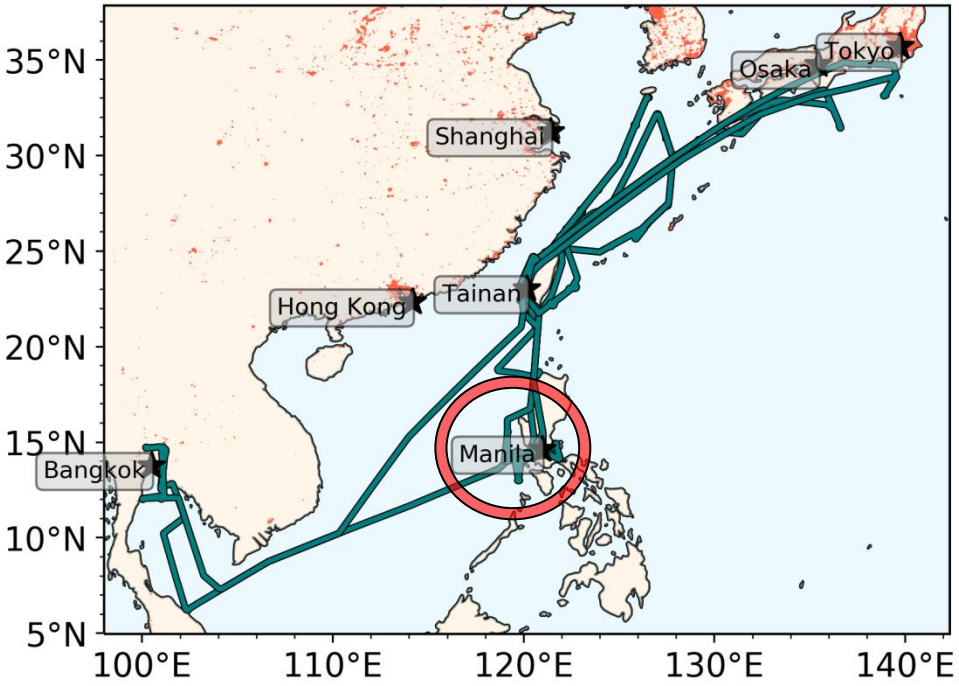
7 measurement flights



EMeRGe-Asia

10.03.2018 – 09.04.2018

10 measurement flights + 4 transfer flights



circled areas: focused regions in this work

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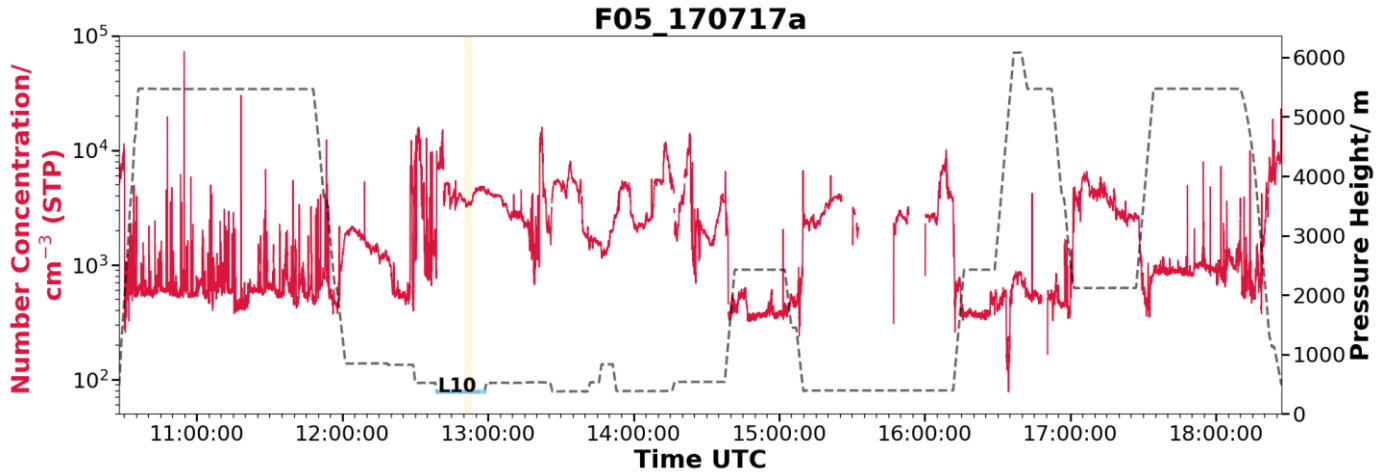
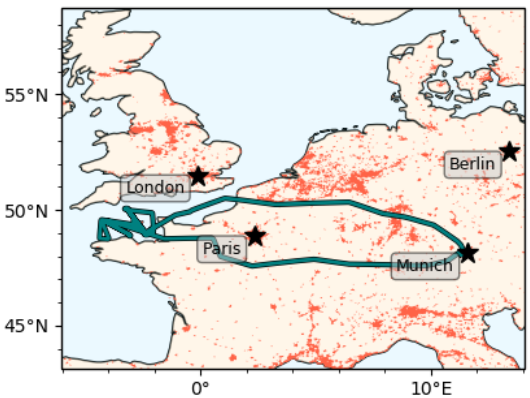
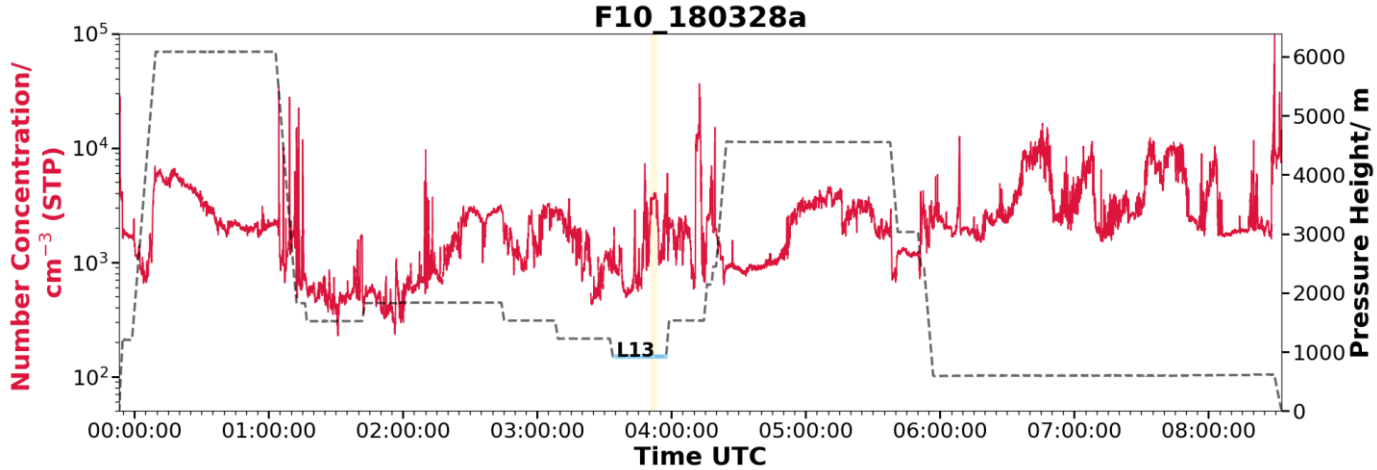
EMeRGe-EU Flight 5 : Investigated city: London



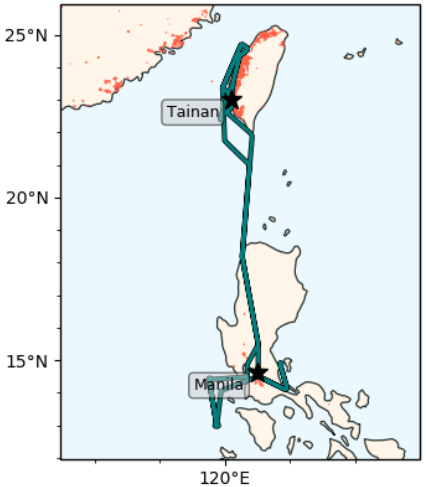
Flight track EMeRGe-EU Flight 05



EMeRGe-Asia Flight 10 : Investigated city: Manila



Flight track EMeRGe-Asia Flight 10



yellow bars:
time periods within a plume from the investigated cities with the same age (6 - 24 hours) tagged by the HYSPLIT model

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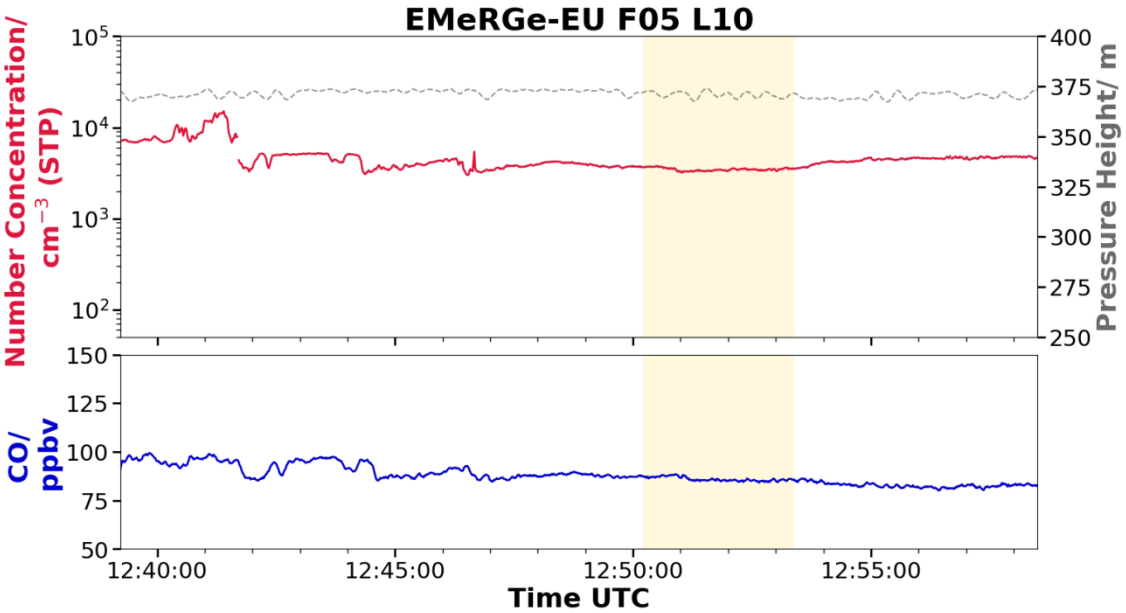
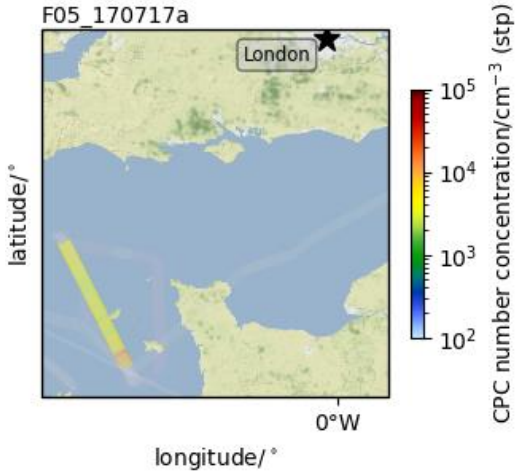
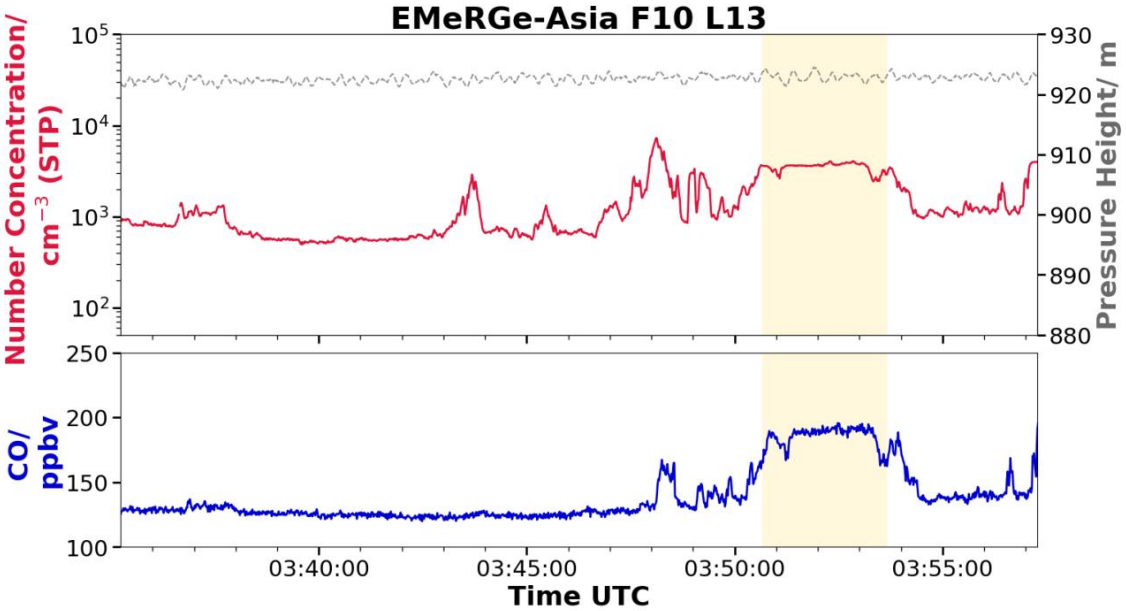


London

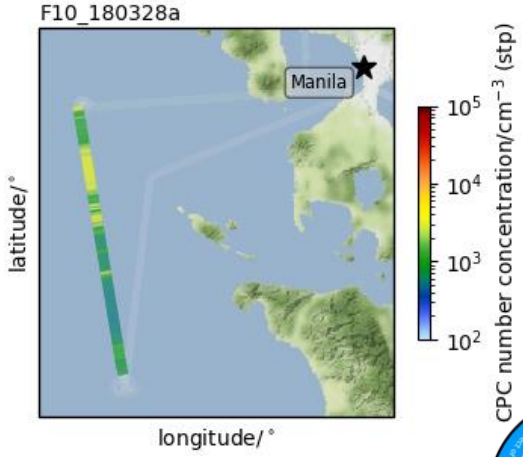
Distance: ~280 km



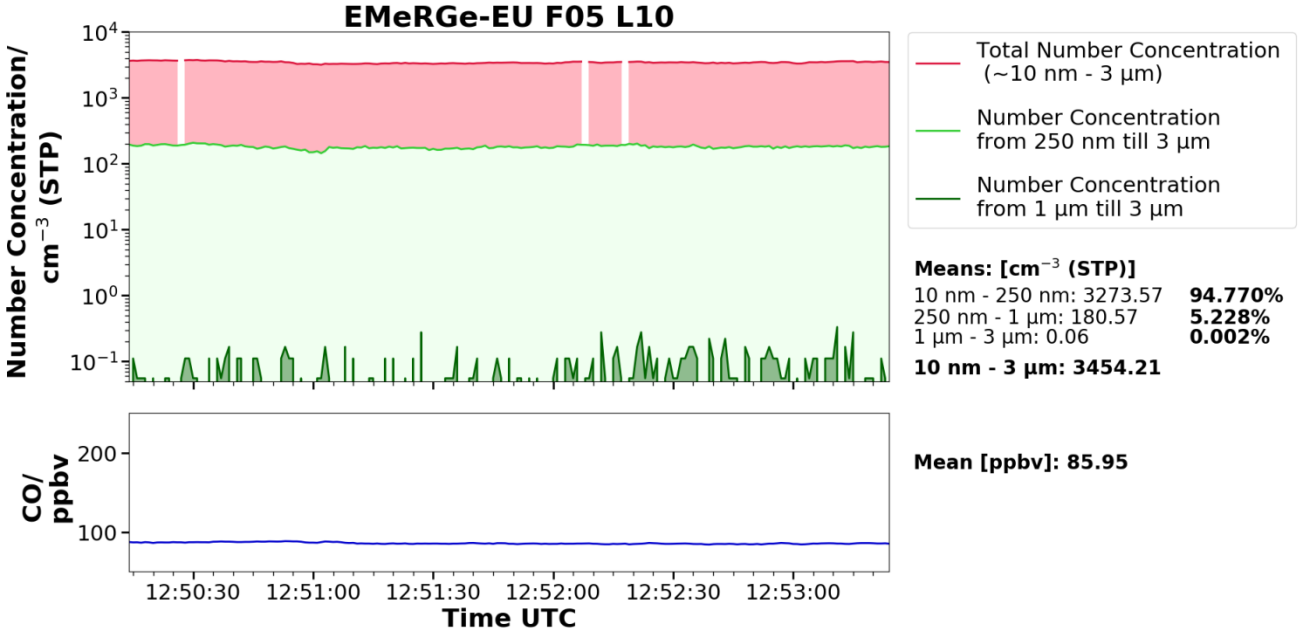


Manila

Distance: ~160 km



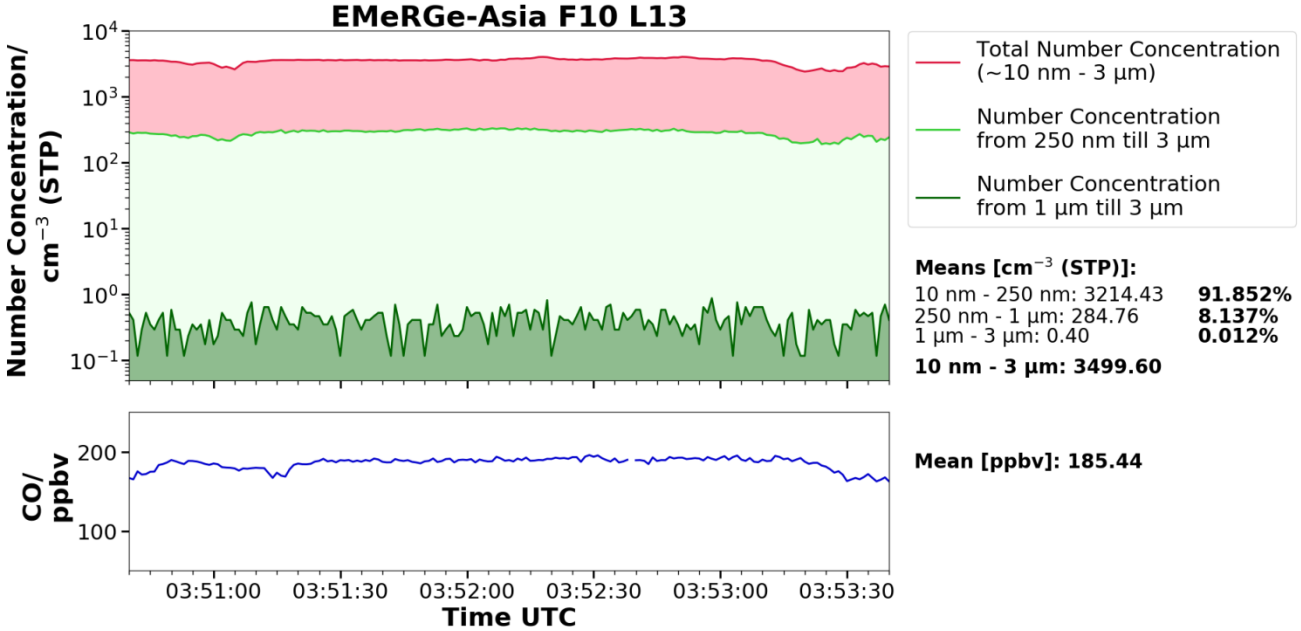
Comparison of the size classes between London and Manila



London

Distance: ~280 km

Pressure height: ~370 m

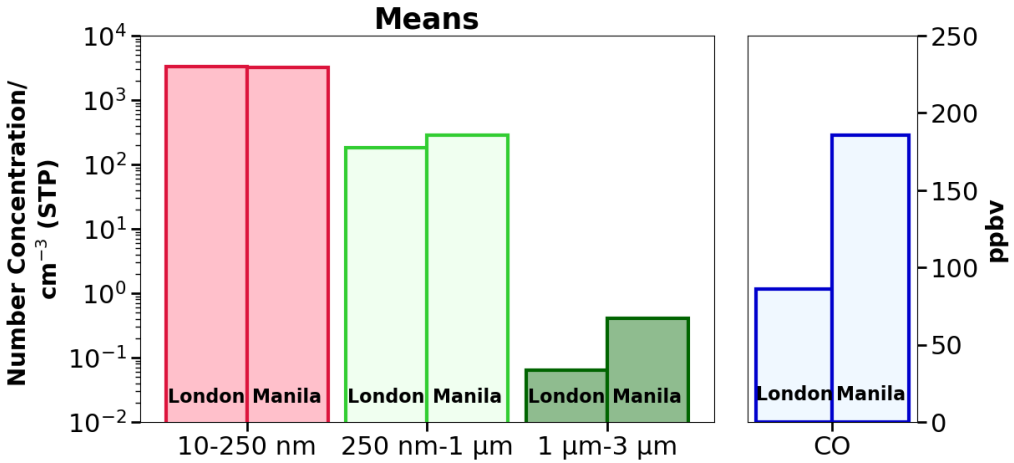


Manila

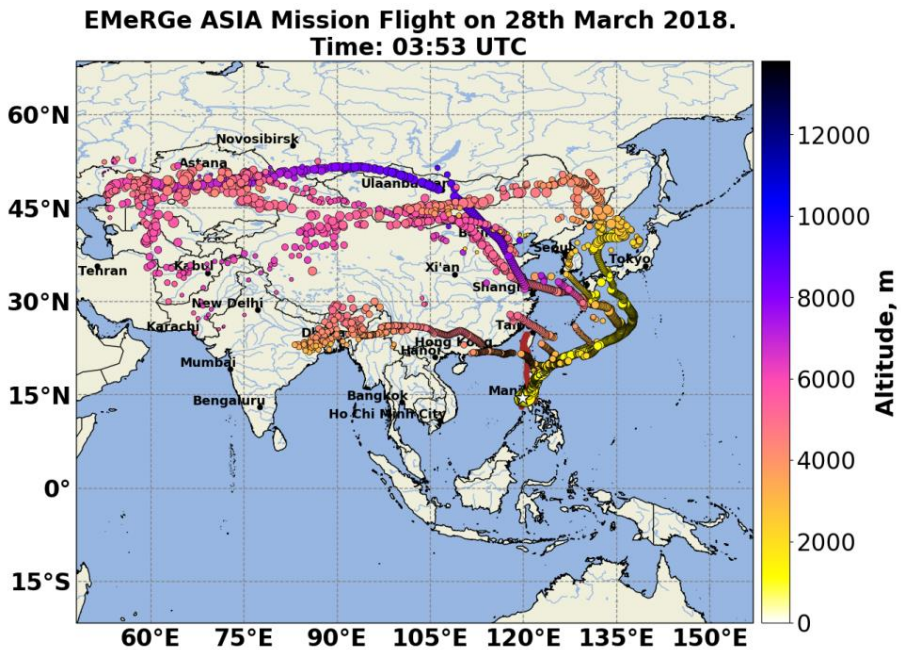
Distance: ~160 km

Pressure height: ~920 m

Conclusion



- Nearly the same concentration of fine mode particles were observed in the pollution plumes of the two Megacitites London and Manila



Backwards trajectories provided by
Anna Beata Kalisz Hedegaard (DLR-IPA/IUP-Bremen)

The higher concentration of coarse mode aerosol in the outflow of Manila might be due to

- **long range transported dust from Central Asia (CALIPSO data on the next chart)**
- **local biomass burning events on the Philippines (→ VOC data from Eric Förster, KIT)**

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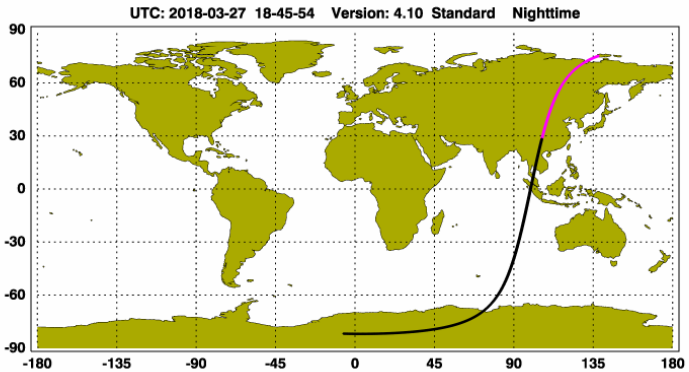
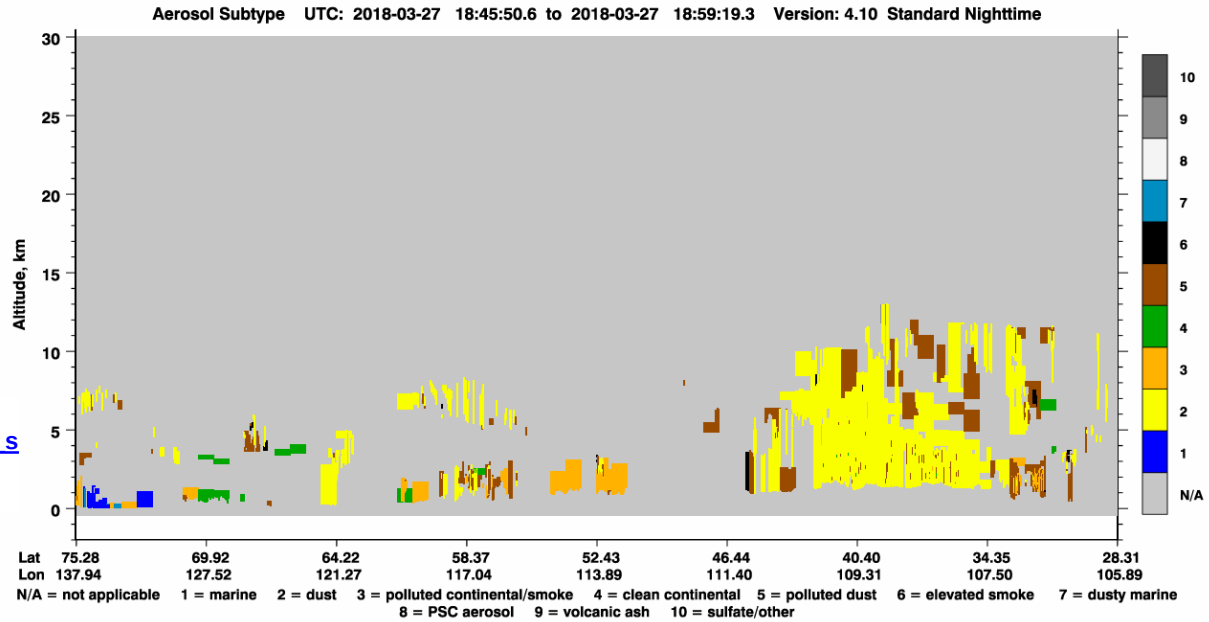
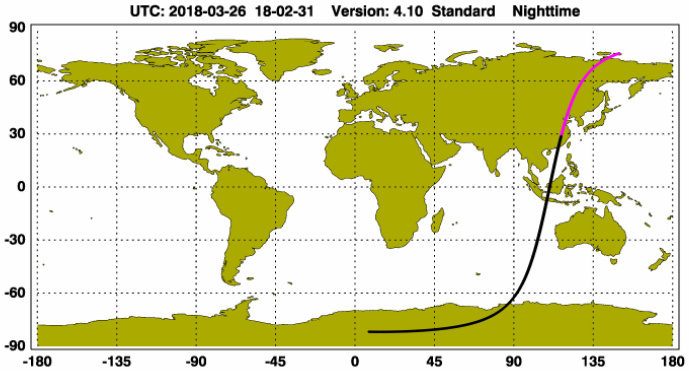
A long lasting dust event occured over Northern China and Mongolia



https://www-calipso.larc.nasa.gov/products/lidar/browse_images/std_v4_showdate.php?browse_date=2018-03-27

Last visit: 28.04.2020





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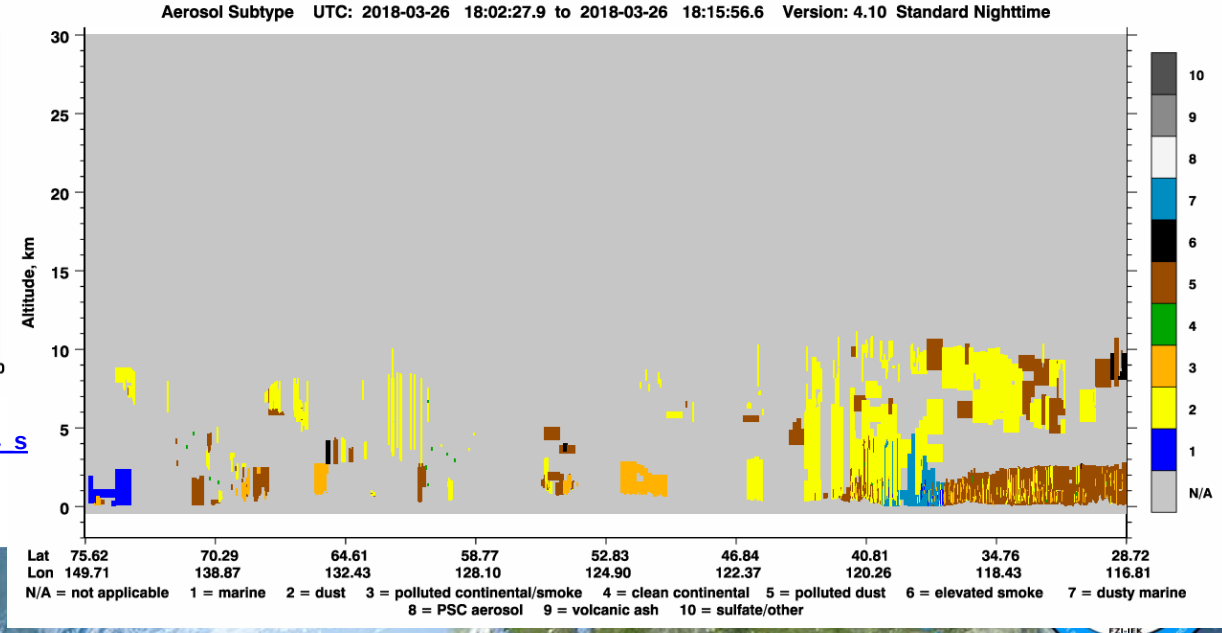

DLR

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