



Supplement of

Comparison of scanning aerosol lidar and in situ measurements of aerosol physical properties and boundary layer heights

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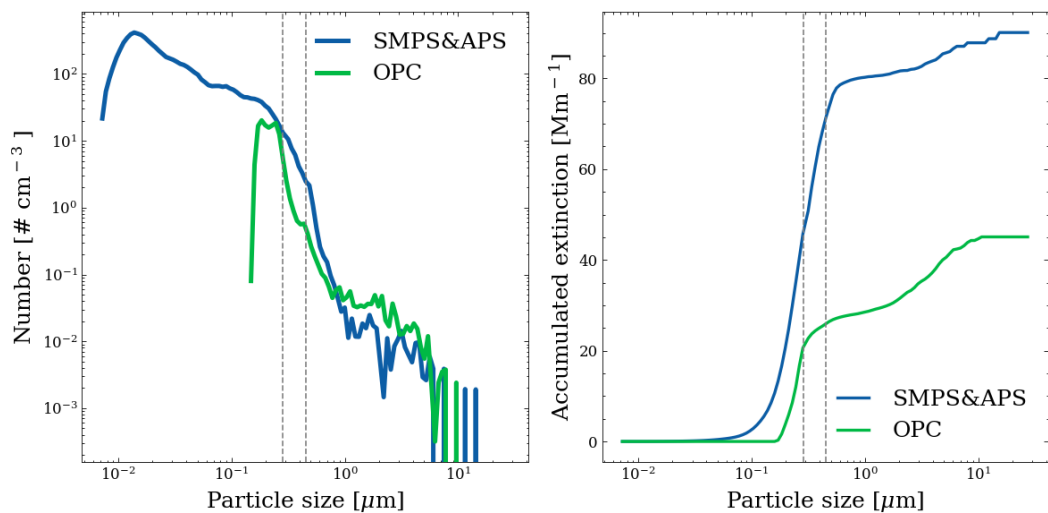


Figure S1. Particle size distribution measured by OPC and merged size distribution measured by SMPS and APS (left) as well as accumulated extinction coefficients calculated from the model calculation based on these two size distributions.

Based on systematic laboratory measurements with the different particle sizes Fidas200 OPC, SMPS, and APS the FIDAS200 counting efficiency was determined (see Figure S2). This counting efficiency was used to correct all measured size distributions.

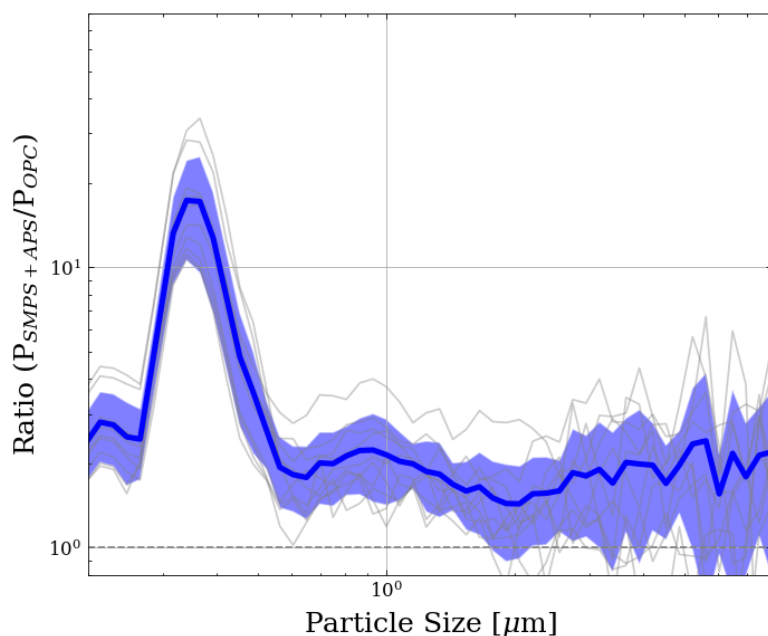


Figure S2. The particle counting effective curve calculated from merged aerosol number size distribution by SMPS and APS data and measured by OPC.

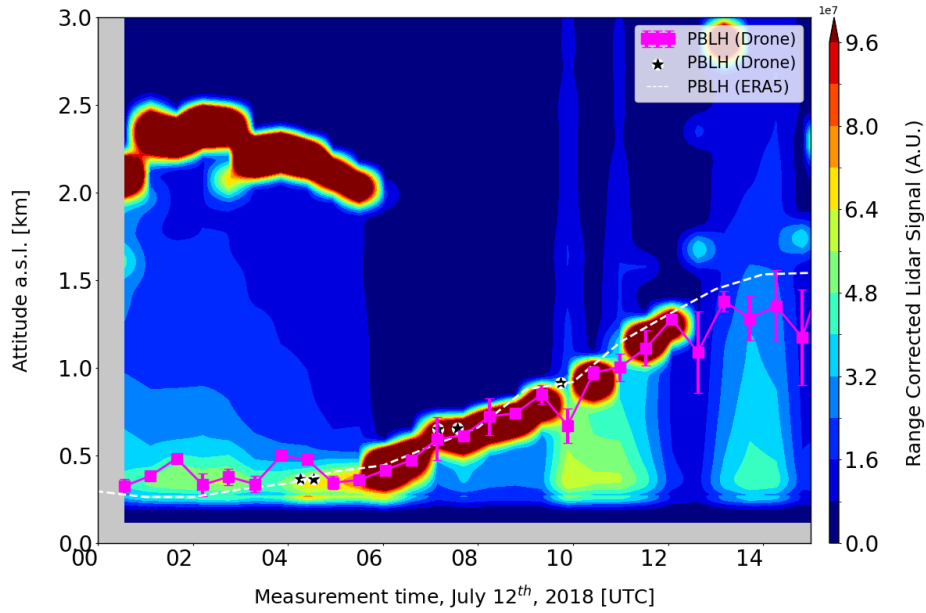


Figure S3. Time series of range corrected LIDAR signal and boundary layer height retrieved from scanning LIDAR (pink squares) as well as boundary layer heights obtained from ERA5 dataset (white dashed line) and vertical potential temperature profiles (white solid line) measured by UAV on July 12th, 2018.

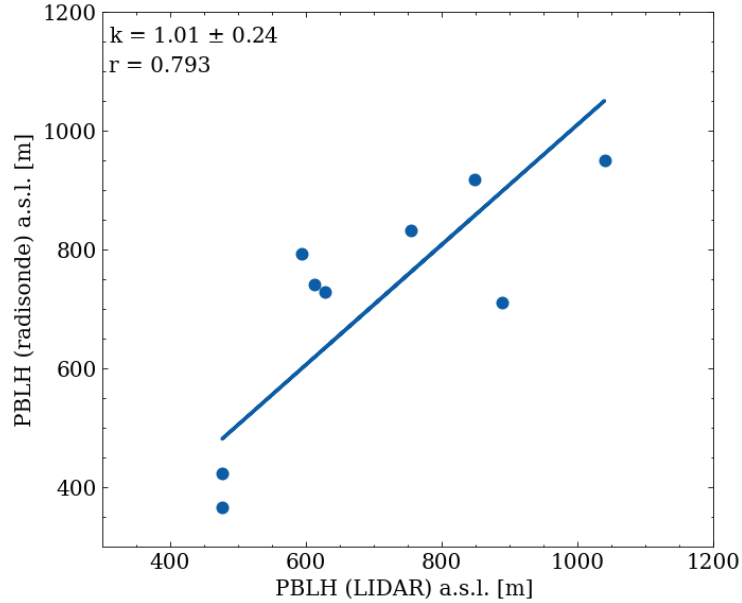


Figure S4. correlation of boundary layer height retrieved lidar and radiosonde measurement on 9th and 12nd, July, 2018 in Jülich.

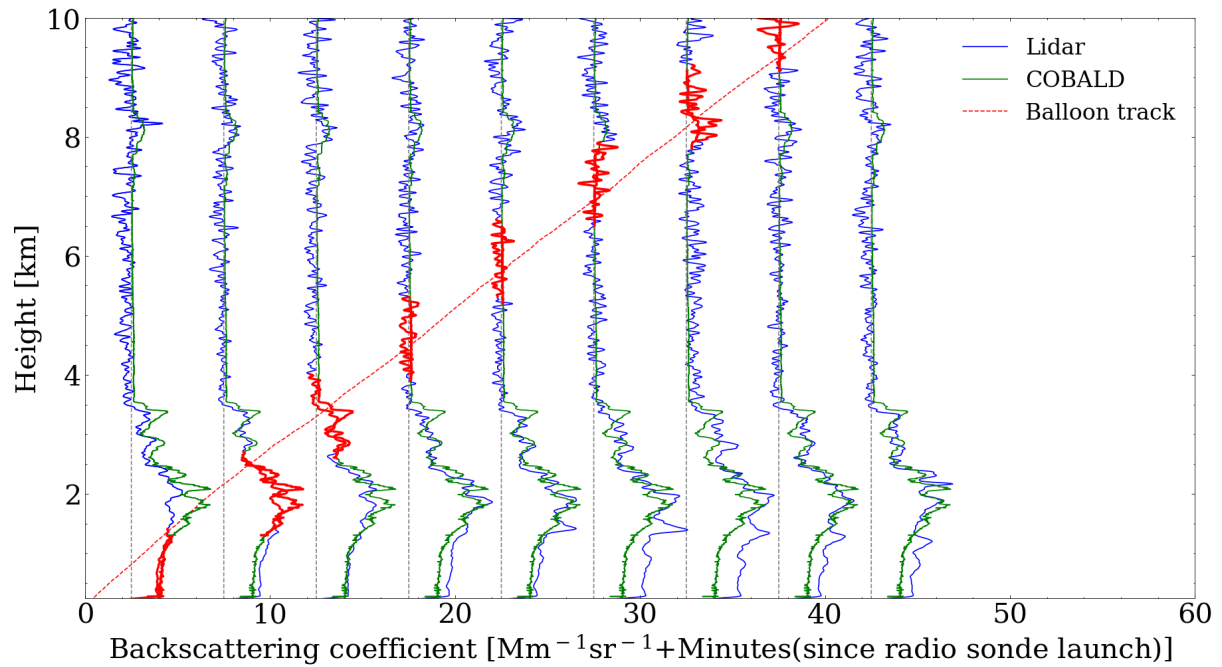


Figure S5. Profiles of backscatter coefficients from LIDAR for integration of 5 minutes and vertical profile of in-suit backscatter coefficient measured by balloon-borne COBALD on July 12th of 2018. The black line segments indicate the altitude ranges selected to get the merged profile of the backscatter coefficient from LIDAR.