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Seasonal variability of the boundary layer growth from ceilometer and eddy-covariance measurements over a suburban site close to Brussels

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The mixing of atmospheric constituents at the Earth's surface such as aerosols, ozone and greenhouse gases is governed by turbulent mixing processes in the atmospheric boundary layer (ABL). The ABL height is a key parameter often used by air quality models and by atmospheric dispersion models. The understanding of its variability and growth rate at different timescales is important with regard to these applications.

This study focuses on the surface-atmosphere interactions, especially on the ABL height variability and its growth on seasonal timescales. We present an analysis of the relationship between the turbulent energy fluxes measured at the surface by the eddy-covariance technique and the growth of ABL height retrieved by the ceilometer measurements. The measurement site for this study is located in a suburban environment (Uccle) in the South of Brussels. The dataset covers the period from 2016 until now. The impact of the urban environment of Brussels, e.g., the heat island effect, on the growth of ABL height is analysed.