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Mixing height determination by ceilometer

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Abstract. A novel method for estimating the mixing height based on ceilometer measurements is described and tested against commonly used methods for determining mixing height. In this method an idealised backscatter profile is fitted to the observed backscatter profile. The mixing height is one of the idealised backscatter profile parameters.
An extensive amount of ceilometer data and vertical soundings data from the Helsinki area in 2002 is utilized to test the applicability of the ceilometer for mixing height determination. The results, including 71 convective and 38 stable cases, show that in clear sky conditions the mixing heights determined from ceilometer based aerosol profiles and BL-height estimates based on sounding data are in a good agreement. Rejected outlier cases corresponded to very low aerosol concentrations in the mixed layer leading to a very weak aerosol backscatter signal in the lowest layer.

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