Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2020-18-RC2, 2020

Atmospheric Measurement Techniques Discussions

Interactive comment on "Integrated System for Atmospheric Boundary Layer Height Estimation (ISABLE) using a Ceilometer and Microwave Radiometer" *by* Jae-Sik Min et al.

Anonymous Referee #3

Received and published: 3 July 2020

General Comment: The atmospheric boundary layer height (ABLH) is an important parameter to characterize the ABL and an important physical parameter in numerical simulations of the atmosphere and environmental assessments. It reflects turbulent mixing, convection, and other physical processes in the boundary layer, and affects the vertical distribution of substances and energy, such as heat, water vapor, and aerosols. In this manuscript, an integrated system was developed for ABLH estimation (ISABLE) using statistical techniques to produce one ABLH optimized by combining the determined ABLHs by previous methodologies. The results contribute to the reasonable determination of atmospheric boundary layer height. I think the work performed by the authors is useful and I recommend publication, after some revisions prior.

Printer-friendly version

Discussion paper

Specific points: 1, Line 26-27, 'Besides, when SBL exists at night, the lower atmosphere is stabilized and stagnant, and atmospheric diffusion does not occur in the lower layer', why? or weak diffusion? 2, Line 28-29, 'the ABL can be used as a meteorological factor to determine the air pollutant concentration', ABL should be ABLH. 3, Line 31-32, 'Many previous studies have developed various methodologies for determining ABLH, such as the ML height (MLH) and SBL height (SBLH).' It is better to change 'such as' into 'including'. 4, Line 35-36, it is better to using 'thermal turbulence and mechanical turbulence'. 5, Line 82-84, Section2, 'atmospheric attenuation and brightness temperature. . .' should be ' electromagnetic wave attenuation'. 6, Section3, Figure2, the noise is really less after pretreatment during the daytime, but the noise is more during the nighttime, why? 7, Section 4.1, Line 162-164, 'When determining the nocturnal SBLH, it is possible to estimate the SBLH using the vertical profile of the thermal parameter only because the turbulence or aerosol layer characteristics can be used to detect the residual-layer at night', please confirm the logical relationship. 8, Section 5.1, Line 334-335, 'ABLH of more than 1 km altitude appeared as outliers at nighttime', if possible, please show the data of the 'heat island phenomenon. 9, Section 5.3, Line 398-399, it is almost no difference for ABLH at clear skies (1202m) and cloudy skies (1085m), but the cloud cover is more difference, why? 10, Section 5., Line 403-404, The maximum seasonal mean ABLH was 1,268m in the Spring season (March, April, May), Please try to explain that using the net radiation data.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2020-18, 2020.

Printer-friendly version

Discussion paper