

EGU21-14016, updated on 02 Aug 2021  
<https://doi.org/10.5194/egusphere-egu21-14016>  
EGU General Assembly 2021  
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## Study of Thermal Activity in The Mixing Layer During First Generated Single Cloud by Using Combined Observation From Boundary Layer Radar, Doppler Lidar and Time Lapse Camera

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Detailed observation of small scale perturbation in the atmospheric boundary layer during the first generated cumulus cloud are conducted. Our target is to study this small scale perturbation, especially related to the thermal activity at the first generated cumulus cloud. The observation is performed during the daytime on August 17, 2018, and September 03, 2018. Location is focused in the urban area of Kobe, Japan. High-resolution instruments such as Boundary Layer Radar, Doppler Lidar, and Time Lapse camera are used in this observation. Boundary Layer Radar, and Doppler Lidar are used for clear air observation. Meanwhile Time Lapse Camera are used for cloud existence observation. The atmospheric boundary layer structure is analyzed based on vertical velocity profile, variance, skewness, and estimated atmospheric boundary layer height. Wavelet are used to observe more of the period of the thermal activity. Furthermore, time correlation between vertical velocity time series from height 0.3 to 2 km and image pixel of generated cloud time series are also discussed in this study.