



Surface Energy Balance at Commercial and Apartment District over Urban in Seoul Metropolitan Area, Korea

Jung-Hoon Chae, Sung-Hwa Park, and Moon-Soo Park

Meteorological Observation Lab., WISE, Yongin, Korea, Republic Of (zhzhah79@gmail.com)

Surface energy balance, carbon dioxide concentration and flux observed at urban commercial and apartment area in Korea from January to December in 2015 are analyzed. Each surface energy balance system observes wind speed and direction, air temperature, and relative humidity at 2 m and 8 m high, 3-dimensional wind at 6 m and 10 m, H₂O/CO₂ gas concentration at 6 m, net radiation (upward/downward shortwave/longwave radiation) at 9 m, air pressure, precipitation, and a surface temperature over the rooftop of buildings. As intensely developed and compact high-rise site, Guro station is located at southwestern part of Seoul Special City, while Anyang station is surrounded by apartment building complex, one of the representative residential area in Gyeonggi Province. The followings are found: (1) The monthly mean net shortwave radiation at Guro station shows higher values than that at Anyang station by 50 ~ 100 Wm⁻²; (2) Net radiation, residual, sensible heat flux show a maximum near noon in May, which is related to the small cloud cover as well as relatively high solar declination angle; (3) Latent heat flux shows a maximum in the afternoon during summer season (June ~ August); (4) CO₂ concentration (flux) shows a maximum during rush hour in January (February) at Guro station, but does not at Anyang station; (5) CO₂ concentration at Guro station show higher than that at Anyang station by 20 ~ 50 mg/m³; (6) Diurnal variation of CO₂ flux shows a positive value throughout the day for all months.