



Surface Energy Balance at an Urban Residential Area in Seoul, Korea

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CO₂ concentration and flux, and surface energy balance observed at urban residential area, Jungnang site, in Seoul from January to December in 2014 are analyzed. The results for the period from 16 to 23 May 2014 show that (1) westerly winds are dominant in the afternoon, (2) vertical gradients of temperature and humidity are negative, (3) vertical gradients of wind speed and friction velocity are positive throughout the day, (4) wind speed shows a maximum in the late afternoon, (5) CO₂ concentration and flux show maxima at the morning rush hour, (6) albedo and Bowen ratio have values of 0.12~0.13 and 7~8, respectively. And the results for the monthly mean values show that (1) net radiation, 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, (2) latent heat flux shows a maximum in the afternoon in July, (3) monthly mean sensible heat flux shows positive values with a small seasonal range, (4) As month goes from January to July, daytime Bowen ratio decreases steeply from 15 to 4, while nighttime Bowen ratio increases slightly from 5 to 8, (5) CO₂ concentration (flux) shows a maximum at rush hour in January (February), (6) As month goes from January to July, CO₂ concentration decreases from 850 to 600 mg m⁻³, (7) diurnal variation of CO₂ flux shows a positive value throughout the day for all months.

Keywords: CO₂ flux, Latent heat flux, Sensible heat flux, Seoul residential area, Surface energy balance, Weather Information Service Engine.