

Behavior of the urban atmospheric boundary layer based on the long data set of the Koganei 1.3GHz wind profiler radar

Seiji Kawamura[1]; Yuichi Ohno[1]; Yasuhiro Murayama[1]

[1] NICT

National Institute of Information and Communications Technology (NICT) started a new project in April 2006, in which we observe the climate above mega-city like Tokyo in detail with remote sensing techniques such as radars and lidars. The data for the urban climate studies are now basically obtained by ground-based anemometers, thermometer, and so on. Applying the remote sensing techniques to the urban boundary layer observations make it possible to investigate the artificial environment in mega-city more precisely. Many problems such as the heat island, the localized torrential downpour, and the transportation of the air pollution are expected to be clarified in this project.

We have a wind profiler radar whose frequency is 1.3575GHz at NICT Koganei headquarter, though it is stopped due to system troubles now. This radar was developed in 1993, and more than 10 years long data set had been archived. In this study we will investigate the behavior of the atmospheric boundary layer over Koganei statistically based on the long data set of this radar (wind velocity, echo power, and Doppler width). Components of land and sea breeze circulations, in which wind is southward in morning and northward in afternoon below about 1 km altitude, are observed at Koganei. These features of wind behavior might be useful for urban boundary layer study such as pollution transportation. We are developing a new wind profiler that is small, low power, and strong for the interference. The possibility of wind profilers for the urban boundary layer study will be also discussed.