Wind characteristics depending on land use types using a CFD model and Wind Lidars

EunRyoung Kim, Gwang-Jin Lee, Chaeyeon Yi, and JungHyo Chea
WISE, Hankuk University of Foreign Studies, Korea, Republic Of (dsm1680@naver.com)

It's important to understand the meteorological characteristics by variety of factors consisting of the space because meteorological environment changes according to spatial characteristics. A computational fluid dynamics (CFD) model is used to simulate the impact of building and topography onto urban flow and dispersion in this study. The result of the mesoscale meteorological model whose resolution is 1 km horizontally is used for the boundary input of a CFD model with 10 m resolution. Three Doppler Wind Lidars which are operated over different surface types (Gwanghwamum: city center surrounded by skyscrapers, Jungrang: resident area with low-rise buildings, Bucheon: outside city covered by grass) are also used for wind characteristics and model verification. CFD model can capture the change of wind speed influenced by city buildings and other landform which cannot simulated by regional model. Both CFD model and observation show that the inflow wind speed is reduced at lower levels due to blocking by buildings in Seoul city center, while at higher level, outflow of CFD model just follows the wind speed of inflow more.