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Features of the urban atmosphere as detected by RASS and 3D sonics

Martin Piringer and Christoph Lotteraner

Central Institute for Meteorology & Geodynamics, Environmental Meteorology, Vienna, Austria (martin.piringer@zamg.ac.at, 0043-1-360 26 74)

In contrast to the classical homogeneous atmospheric boundary layer, the urban boundary layer is more complex due to several specific features and processes caused by the buildings which introduce a large amount of vertical surfaces, high roughness elements, and artificial materials. The most well-known result is the urban heat island, but urban areas also influence the wind field, precipitation, atmospheric stability, and the mixing height.

The last two are essential to determine the spread of pollutants in urban areas. Atmospheric stability can properly be derived with 3D sonics via the sensible heat flux; The mixing height can be deduced from vertical temperature profiles provided by Sodar-RASS systems. The contribution will highlight the methodologies, give examples, and critically discuss advantages and shortcomings of the instruments and the methods applied.