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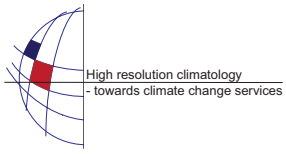


# Selected characteristics of the atmospheric turbulence over a central European city centre – spectral statistics

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Knowledge of the structure of turbulence is essential for many practical applications including atmospheric dispersion. In accordance of Monin-Obukhov (M-O) similarity theory, over homogenous surface both spectra and normalized velocity standard deviations, should depend on stability parameter, z/L, where L is Obukhov length and z sensor height. In the urban atmosphere applicability of M-O is still questionable because shrinking of inertial sublayer where this theory is supposed to work. The objective of this study is to investigate spectral turbulence statistics at two urban measurement points located in Łódź, central Poland (population ca 750,000). Turbulent fluxes were measured with the aid of fast respond sensors (sonic anemometers and gas analyzers) at two points in the city centre. At the firs point data were collected in years 2000-2003 and at the second point measurements are continued since 2005. At both stations sensors were mounted at thin masts at the level (37m and 42m above ground) significantly exciding mean building height (11m and 17m respectively). Calculated spectral characteristics include spectra and cospectra in different stability classes focused on verification of the Monin-Obukhov relationships. Results show that power spectra of wind components for close to neutral conditions fit to reference spectrum based on Kansas experiment. For a non-neutral stability wind spectral peaks show a shift to lower frequencies as instability increases. Results for a temperature spectra and cospectra do not lead to clear conclusion on spectral function shape and applicability of M-O theory.