# Spectral characteristics of the turbulence over urbanized area.

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We present a spectra and cospectra derived from long-term eddy-covariance measurements in Ł ódź, central Poland. The data were collected at two measurement sites located in the core of the city centre: Lipowa (period 2006-2011) and Narutowicza (period 2005-2011). The sensors heights (37m and 42m respectively) exceed mean roof level more than two times at both sites. The data were collected in 1 hour files and spectra were calculated for the same time intervals. The high quality of the data is ensured by different stationarity tests and careful data selection procedure. As the dependence of the (co)spectra shape on the stability is poorly known on urbanised areas we focused on this problem. Similar to Kaimal et al. (*Quart. J. Roy. Meteorol. Soc.* 98, 563–589, 1972) spectra and cospectra follows -2/3 law for spectra and -4/3 law for cospectra in the inertial subrange. We also observed progression towards higher frequency of the spectral and cospectral peak with increasing stability. On the base of spectra shape the non-dimensional dissipation rates of turbulent kinetic energy, $\phi_\varepsilon$, ware calculate as a function of stability parameter, $\zeta$. In contrast to the Kansas experiment in unstable conditions $\phi_\varepsilon^{2/3}(\zeta)/\phi_\varepsilon^{2/3}(0)$ first decrease from 1 at $\zeta = 0$ to a minimum approximately at $\zeta = -0.25$ and next increase with more negative $\zeta$. For the stable conditions $\phi_\varepsilon^{2/3}(\zeta)/\phi_\varepsilon^{2/3}(0)$ follows standard function.