Licznar, P., Siekanowicz-Grochowina, K. Application of Laser Disdrometer to Weather Radar Image Calibration in the Example of Warsaw. *Ochrona Srodowiska* 2015, Vol. 37, No. 2, pp. 11–16.

Abstract: Exploitation problems with overloaded combined drainage systems in the biggest cities of Poland prompt development of the Real Time Control (RTC) systems as well as encourage progress in hydrodynamic modelling of urban drainage systems. Practical implementation of these activities in big agglomerations requires access to a new source of information about spatio-temporal structure of rainfall fields. Currently, this could be only achieved by implementation of weather radar techniques. A prerequisite here, however, is the development of effective radar signal calibration techniques. With this in mind, a possibility of laser disdrometer OTT Parsivel2 application to conversion of radar reflectivity (Z) into precipitation rate (R) was explored. The observational sets from year 2013 recorded by the disdrometer installed in Warsaw, Poland were analyzed. Z–R relationships were determined at various time resolutions in the range from 10 s to 10 min. A typical power-law relationship was found to describe them, while their parameters (a=155 and b=1.53), obtained at the initial time resolution of 10 s, were at the level of those most often published for rainfall-dominated precipitations. Moreover, a significant shift in Z–R parameters was noticed with changing temporal resolution of the analysis. An increase in the parameter a with simultaneous decrease in the parameter b was observed when extending the time of temporal study resolution. The phenomenon could be explained by averaging of Z and R values when extending temporal windows of resolution.

Keywords: Radar reflectivity, Z–R relationship, urban hydrology, precipitation field modelling.