



Calculations and analyses of systematic errors in precipitation measurements

Mojca Sraj and Urska Bajc

University of Ljubljana, Faculty of Civil and Geodetic Engineering, Ljubljana, Slovenia (mojca.sraj@fgg.uni-lj.si, +386 1 251-9897)

Point measurements of precipitation serve as the primary source of data for hydrological, climatological and geographical calculations. However, the amount of precipitation measured by commonly used gauges include a series of errors and is normally underestimated. This error is induced mainly by wind field deformation above the gauge orifice (aerodynamic effect), evaporation of the accumulated water, wetting of the internal walls of the collector, inability to completely empty the collector, splashing of raindrops and blowing of the snow and varies from 3 to 30 % of measured precipitation for liquid precipitation.

Calculations and analyses of systematic errors were made for four Slovenian meteorological stations. Stations were selected according to their location (climate), height above sea level and average yearly precipitation amount. Spatial variability of precipitation in Slovenia is very high and strongly linked to the topography. Year 2008 was selected as calculating period in the study. Datasets with different time resolution were used: daily scale datasets and 30-minute interval datasets. The correction of precipitation was based on five methods most often used in similar studies: sevruc, Dahlstrom, Mendel, Penev and method of Dynamic correction model (DCM).

Daily and average monthly correction factors were compared and analysed. Correction factors on the annual level were between 6 – 114 %. Different correction methods gave comparable results. Larger differences occurred over use of different time resolution of the input datasets. In general, monthly correction factors increased with the higher accuracy of the input data and with lower precipitation amounts.