



Results of Dynamic Calibration of Tipping-Bucket Rain Gauges

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Experimental research in the Department of Frequency Engineering in the Czech Metrology Institute (CMI) in Prague, the Czech Republic, is focused on stability of received signal on terrestrial radio and optical paths. Rain can cause serious attenuation of electromagnetic waves in the frequency bands over 10 GHz. Therefore, our experimental research is also focused on our own meteorological measurement in the vicinity of experimental radio and optical paths.

The heated tipping-bucket raingauge MR3H manufactured by Meteoservis, the Czech Republic, with the collector area of 500 cm² and the rain amount per tip of 0.1 mm is used at CMI for the measurement of rainfall intensities. The time of tips is recorded with uncertainty of 0.1 second. The obtained time of tips are stored by PC and recorded on CD-ROM.

It is generally known higher rainfall intensities measured by tipping-bucket rain gauges are underestimated. Therefore, after static calibration the tipping-bucket rain gauge was dynamically calibrated by water flowmeters. The Brooks FLOMEGA Flow Meters models 5882 and 3750 were used for the rain gauge calibration in the range from 2.6 mm/h to 530 mm/h. The used method of dynamic calibration of raingauges and our experience obtained will be described. The dependence of the measured rain intensity on the reference rain intensity (calibration curve) will be presented. Both the results obtained and the influence of dynamic calibration on our results concerning attenuation of electromagnetic waves due to rain will be discussed.

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