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The first laboratory intercomparison of rainfall intensity gauges

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The first Laboratory Intercomparison of Rainfall Intensity Gauges was performed by the World Meteorological Organisation (WMO) from September 2004 to September 2005. The intercomparison was held simultaneously in the laboratories of the Royal Netherlands Meteorological Institute, MétéoFrance and the Department of Environmental Engineering (University of Genoa). The 19 pairs of participating instruments from 18 manufacturers were divided into three groups, with each group being tested for a period of about three to six months in each of the laboratories, in order to obtain a high degree of confidence in the results.

The main objective of this laboratory intercomparison was to test the performances of catchment type rainfall intensity gauges of different measuring principles under constant flow rate conditions. Other objectives were to define a standardized procedure for laboratory calibration of catchment type rain gauges, to comment on the need to proceed with a field intercomparison of catchment type of rainfall intensity gauges and to identify and recommend the most suitable method and equipment for reference purposes within the field intercomparison of catching and non-catching types of gauges. Finally the aim was to provide information on different measurement systems relevant to improving the homogeneity of rainfall time series with special consideration given to high rainfall intensities.

The results of the Intercomparison show that only those tipping-bucket rain gauges that apply proper correction perform accurately enough. As for the performance of

weighing gauges, their accuracy is generally higher than tipping-bucket rain gauges, although many of them are subject to a quite long delay in response, with large errors applying to rainfall intensity measurements. Other measuring principles were also tested, but the small number of instrument submitted (two) did not allow to obtain any conclusive information.