Geophysical Research Abstracts,
Vol. 10, EGU2008-A-10522, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-10522
EGU General Assembly 2008

The WMO Field Intercomparison of Rain Intensity Gauges

E. Lanzinger (1), M. Leroy (2), B. Baker (3), E. Vuerich (4), L. Stagi (5), L.G. Lanza (5) and I. Ruedi (6)

(1) Deutscher Wetterdienst, Hamburg, Germany, (2) Météo-France, Département de l'Observation de Surface, Trappes, France, (3) NOAA/National Climatic Data Center, Asheville, NC, (4) ReSMA - Italian Meteorological Service – Italian Air Force, Vigna di Valle (Rome), Italy, (5) University of Genova, Dept. of Construction, Environmental and Territorial Engineering, Genova, Italy, (6) World Meteorological Organisation, World Weather Watch Department, Geneva, Switzerland (luca.lanza@unige.it)

The World Meteorological Organisation (WMO) performed a Laboratory Intercomparison of Rainfall Intensity Gauges from September 2004 to September 2005. The intercomparison was held simultaneously in the laboratories of the Royal Netherlands Meteorological Institute (KNMI), MétéoFrance and the Department of Environmental Engineering at the University of Genoa, Italy. The main objective of this laboratory intercomparison was to test the performance of catching type rainfall intensity gauges using different measuring principles under constant flow rate conditions. The Final Report of the Laboratory Intercomparison is available as IOM Report No. 84, and can be found on the Internet at the following URL: www.wmo.int/web/www/IMOP.

The laboratory tests were performed under controlled conditions and constant flow rates (rain intensities). However, in the real world, rainfall intensity is highly variable over even very short intervals in time and catching errors may also have strong influence on the overall accuracy of the measurement. The weather related conditions (wind, wetting, evaporation, etc.) that may produce significant catching errors can hardly be reproduced in the laboratory, unless very large economical and human resources are involved. The same is true for calibration of non-catching types of gauges that were excluded for this reason from the Laboratory Intercomparison, although of

great interest to the meteorological community.

The need of combining the assessment of both “counting” and catching errors for the instrument analysed in the laboratory is evident, since the demand of knowledge from the users refers to operational conditions. Provided the instrument is properly installed in the field, according to WMO specifications, the question to be answered is what kind of instrument (measuring principle, manufacturer, model) is the most suited to the specific requirements of the user. This question can not be answered based on the Laboratory Intercomparison alone, although the results attained hitherto can easily provide indications for the manufacturers and a first-step selection criterion for the user.

The WMO Commission for Instruments and Methods of Observation therefore decided to proceed with the quality assessment procedure initiated in the laboratory by organising a follow-up intercomparison in the field where the same instruments already tested in the laboratory would be involved. This will allow continuity in the performance assessment procedure and result in the estimation of the overall operational error to be expected in the measurement of rainfall intensity in the field. This field intercomparison also includes many non-catching type of instruments. For the first time, the various types of instrument which can be used for Rainfall Intensity measurements are therefore represented

The WMO Field Intercomparison of RI gauges was therefore started in October 2007 in Vigna di Valle, Rome (Italy) under the supervision of the ET/IOC. Installation of the instruments in the field was preceded by the laboratory calibration of all submitted catching type rain gauges at the University of Genoa, and periodic testing of the gauges is now performed using a portable calibration device.

This paper reports about the rationale behind the Intercomparison, the technical characteristics of the instruments involved, the field site preparation, installation and maintenance, the calibration and validation methods, the quality assurance procedures, and methods for the analysis of the results and intercomparison of the instrument performances. Data from the initial rain events already measured at the field site are presented together with their preliminary elaboration.