



## **Certified accuracy, standards and calibration in precipitation measurements**

**L.G. Lanza** and L. Stagi

DICAT – University of Genoa, 1 Montallegro, 16145 Genova, Italy ([luca.lanza@unige.it](mailto:luca.lanza@unige.it), Fax: +39 010 3532481)

Rain gauges provide the only direct measurements of rainfall intensity at the ground and are usually referred to as the “ground truth” in rainfall monitoring. Newly developed techniques for extensive rainfall observations based on remote sensing provide a space-time description of rainfall fields, but still require the use of rain gauges for calibration and validation purposes.

Since the European Commission Working Document on Research and Standardisation (COM98/31), standards - being one of the tools to foster homogeneous quality - are recognised to be in a strategic position to promote the competitiveness and interoperability of products and services. The development of new standards and their implementation however depend on considerable amount of preliminary research.

CEN/TC 318 “Hydrometry”, developed specific activities aimed at “the standardisation of methods and instrumentation relating to techniques for hydrometric determination including (...) precipitation”. In CEN TC 318 an EN (European Standard that carries with it the obligation to be implemented at national level by being given the status of a national standard and by withdrawal of any conflicting national standards) on a standard reference rain gauge pit has been already prepared within the efforts of WG5 towards a “Reference rain gauge station”. The authors are not aware of any activity within ISO on this subject, although the subject in principle could be included under ISO/TC 113.

For many years, the World Meteorological Organisation (WMO) has been publishing its own Technical Recommendations. Following the Terms of Reference of the WMO Commission for Instruments and Methods of Observations an Expert Meeting on rainfall intensity (RI) measurements was held and the organisation of a related

laboratory inter-comparison of RI gauges was successfully undertaken. Results are recalled in this paper, together with the recommended procedures for calibration and certification of accuracy. The need for further research steps towards homogenisation of standard quality of instruments as well as towards the establishment of criteria to assess data quality is more than evident. The development of a qualification module for RI measurement instruments allowing quality assurance and metrological confirmation of rain gauges according to the European Standard ISO/EN30012-1 was just a first step ahead in this direction, although much work is still in progress regarding the accuracy and range requirements, the development and proper configuration of calibration equipment for field testing, etc.