



**Re.S.M.A.**

When I can measure, I rarely know



**Italian Air Force  
Center of Aeronautic  
Meteorological  
Experimentations**

### Intensity of precipitation and comparison among different measuring instruments

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#### PRESENTATION AND TASK

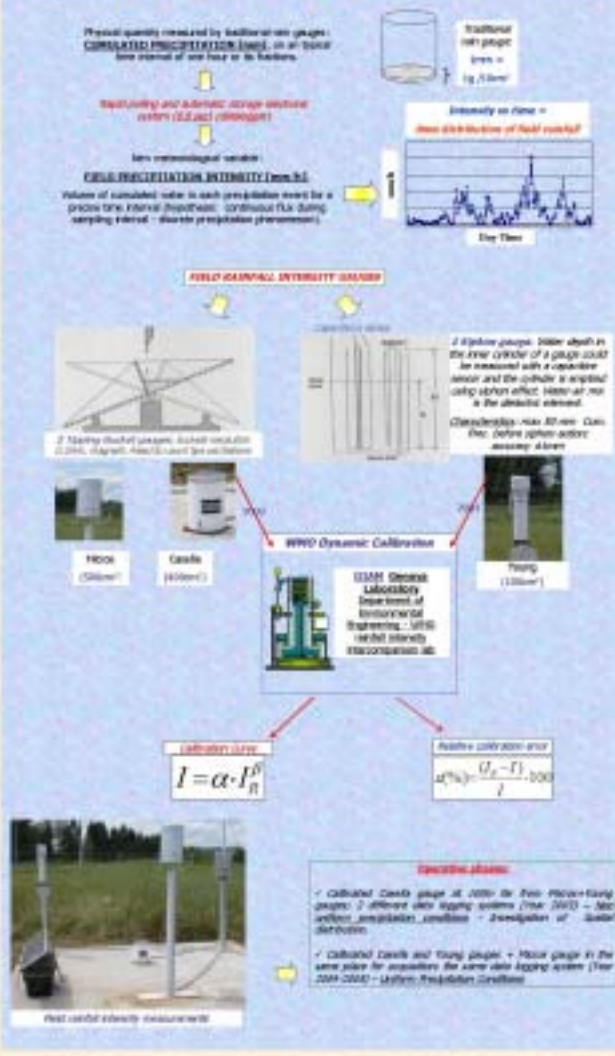
The traditional point measurement of rainfall (mm) consists in measuring the rainfall during a defined period of usually one hour or fraction. A new measuring method was introduced to improve rain gauges performance: changing consecutively the sampling radius time along, it's possible to estimate the intensity of precipitation (mm/h), calculated as the volume of collected water in a fixed time interval, supposing a continuous flow during this sampling time (the phenomenon becomes discrete under a certain value of this interval). Since the knowledge of this quantity could be of great interest for practical utility, the Italian Air Force Center of Aeronautic Meteorological Experimentations (Re.S.M.A.), next to Bracciano Lake (Rome), performed a rainfall intensity campaign employing its own different rain gauges that have been used simultaneously to make field comparisons in its experimental area. The meteorological F24 Vigonza di Valle ground station (MNO162234, RBS4, GAN, GC05, EX005 station) is cited here and allows to obtain every useful atmospheric data for present weather during measurements. This area obviously responds to WMO recommendations on siting and exposure of precipitation sensors (LIMB guide WMO 853, 8.6). However the site "phenomenic characteristics" watched the time frequency and intensity rainfall requirements which permitted operators to perform good field measurements.

The ongoing experiment allowed our technical knowledge on field rainfall intensity determination using different collecting rain gauges connected to electronic datalogger (data online and storage). Moreover the calculated time distribution of field rainfall intensity (mm/h or daytime) showed us the essential behavior of the atmosphere. From a value of correlated precipitation, the time distribution is really the variable that has a severe climatic and environmental impact. It helps the best control of the Italian Air Force Meteorology Network (ITA-FD-MRE): the knowledge of the "ground rainfall" (intensity) and the linked meteorological situation could permit to create a sort of Alert System for leisure events and forecasting (weather work), for rain signal radars comparisons and for geological purposes.

We dedicate the present item to the first man Europe who tried to measure precipitation: his name was Galileo Galilei. In the spring of 1639, to investigate the Tiberine Lake drought, he built the first rain gauge of the history: a 22.8cm x 17.7cm glass cylinder!



#### Methodology and Instrumentation



#### Field rainfall intensity measurements at Re.S.M.A.

