

“Capacity Building and Strengthening Institutional Arrangement”

Analysis and sampling of air and air pollution

Environmental Metrology: the Italian Approach

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APAT

Agency for Environmental Protection and Technical Service

Technical Institute of the Italian Ministry of the Environment

Missions

- protection of the environment
- national focal point for the European Environment Agency
- promotes coordinated development of the national system of environmental control



APAT Organization

6 Technical Departments

Soil Protection

Water Resources Protection

State of the Environment and Environmental Metrology

Nuclear, Technological and Industrial Risk

Nature Protection

Library, Documentation and Information



Department State of the Environment and Environmental Metrology

Missions

Focal point for the European Environment Agency

Develops and coordinate the Italian Information Network

Develops and harmonizes environmental indicators

**Assures comparability of environmental
 data at national level**



Analytical Laboratories & Field Surveys Service (Environmental Metrology)

Mission

Assures quality of analytical data
 in support of environmental policies



...in compliance with

... National environmental legislation and EU

Directives concerning environmental monitoring
 activities

Quality of analytical data

- Data quality is a measure of
- the degree of usefulness
- of the data for a specific
- purpose

Monitoring activities

- Monitoring arising from National legislation and EU Directives
- Monitoring at Regional level (spatial and temporal comparison)
- Particular needs (operational monitoring to meet specific operation needs)

Quality of monitoring data

- Monitoring data must permit comparability of the measurand of interest along the Italian territory
- Monitoring data must permit to follow the trend of the measurand of interest
- Monitoring data must permit the compliance against regulation limits



Quality of monitoring data requires

- use of harmonized & validate analytical & sampling methods

- comparability between laboratories

- about 100 ARPA/APPA (regional) laboratories across Italy



APAT Environmental Metrology Activities

J production and characterization of matrix reference materials

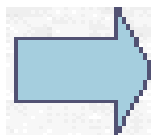
☺ organization of intercomparison exercises (with regular frequency)

☺ coordination of a network of reference laboratories

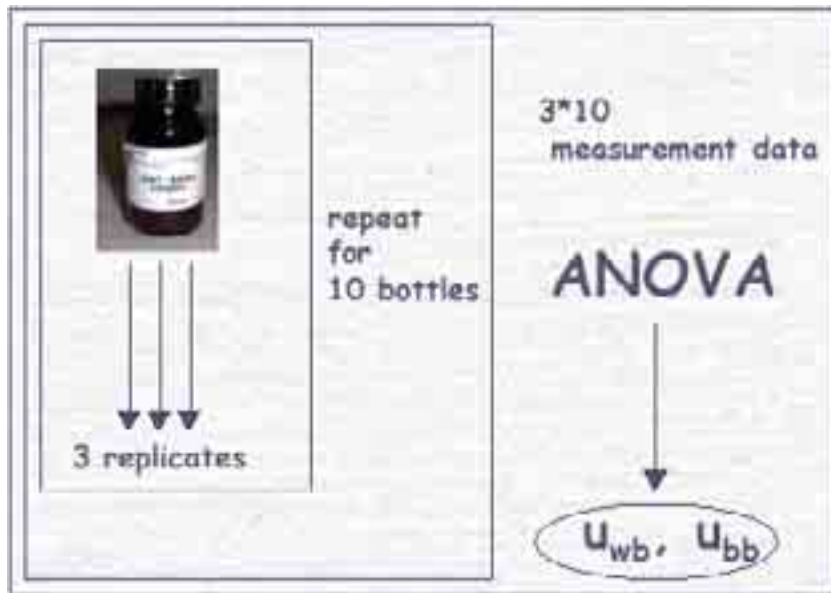
☺ collaboration with the National Institute of Metrology (INRIM)



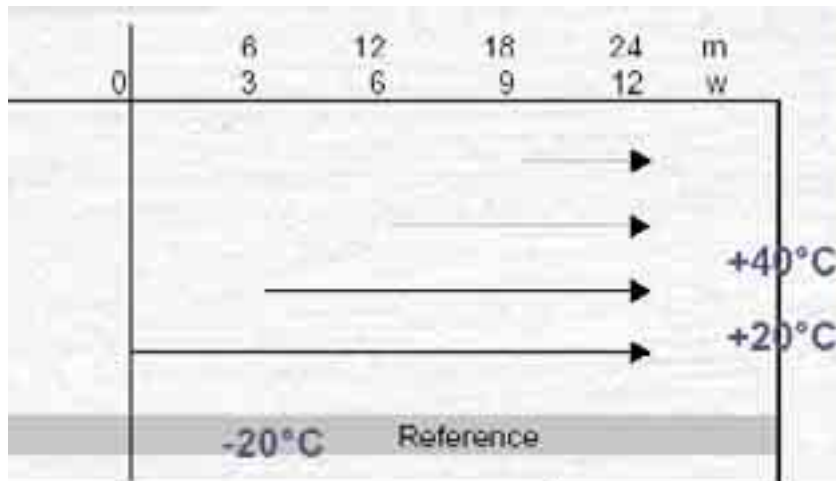
Production and characterization of reference materials



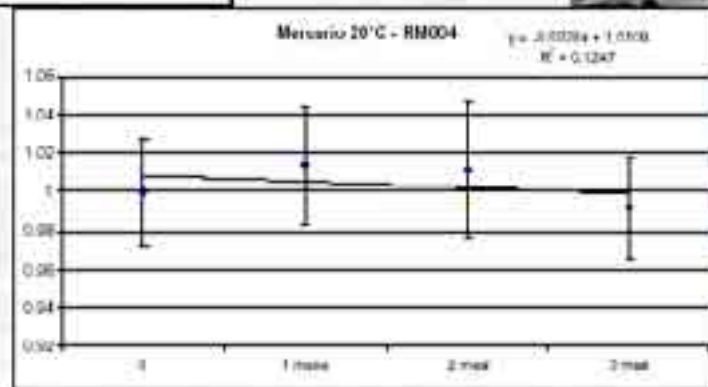
Homogeneity study



Stability study



Isochronous



Characterization of reference materials

☀ characterization with different methods

☀ expert laboratories

$$U_{Rm} = k \cdot (u_{car}^2 + u_{bb}^2 + u_{lst}^2 + u_{stb}^2)^{1/2}$$

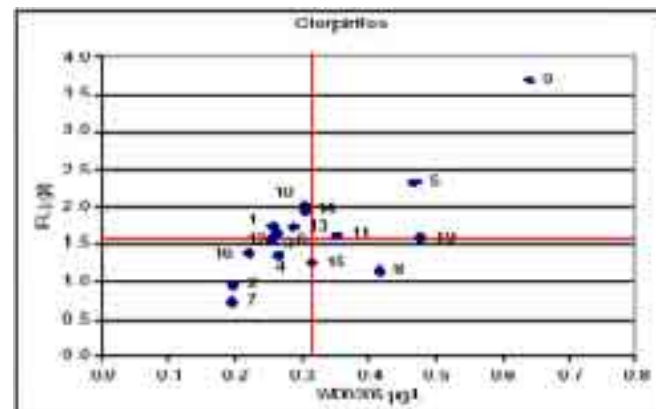
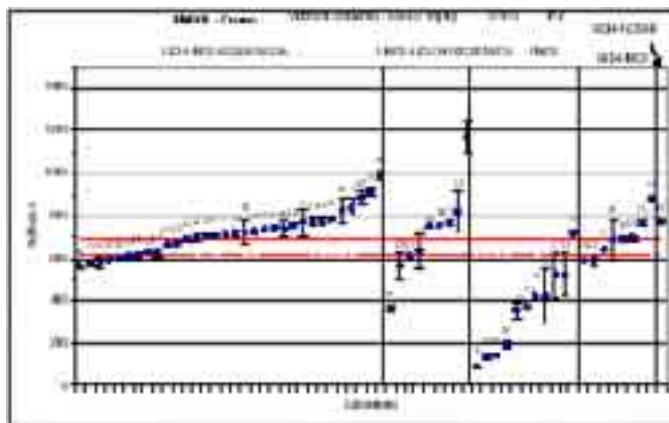


☀ Quality Manual for ISO Guide 34 & ISO 17025 accreditation in progress



Proficiency Testing organization

- ISO Guide 43-1
- Permanent advisory committee - GTP
 (chemists, biologists, quality assurance managers, end-user of data coming from ARPA/APPA & research institutions)



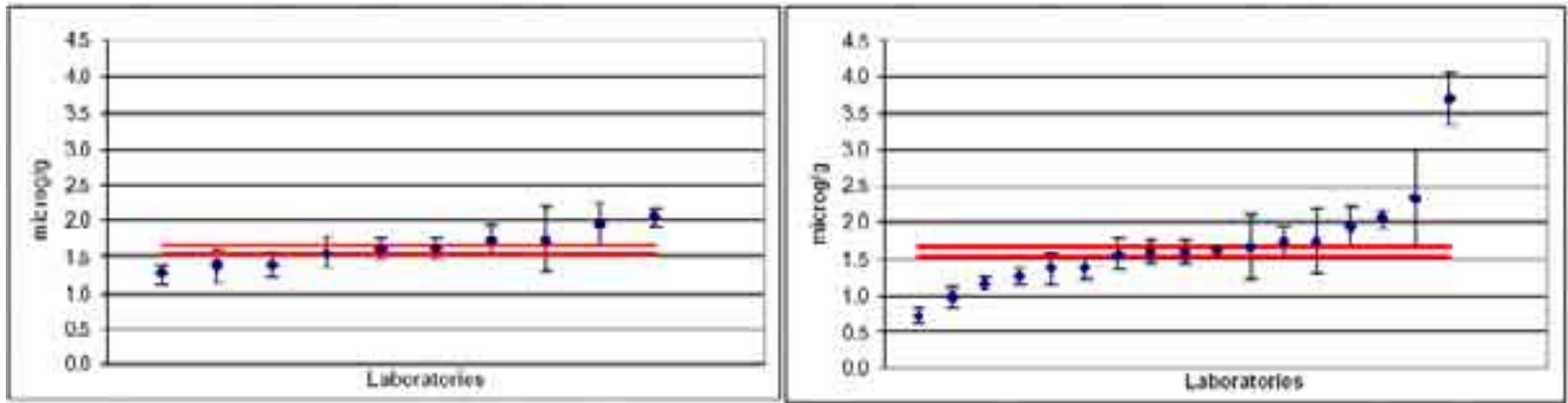
Permanent advisory committee

supports APAT :

- in the selection of the type of test material, analytes and frequency of the rounds
- in the selection of the scoring system
- in the preparation of the protocol sent to the participants
- in the definition of the content of the final report
- in the selection of the level of confidentiality

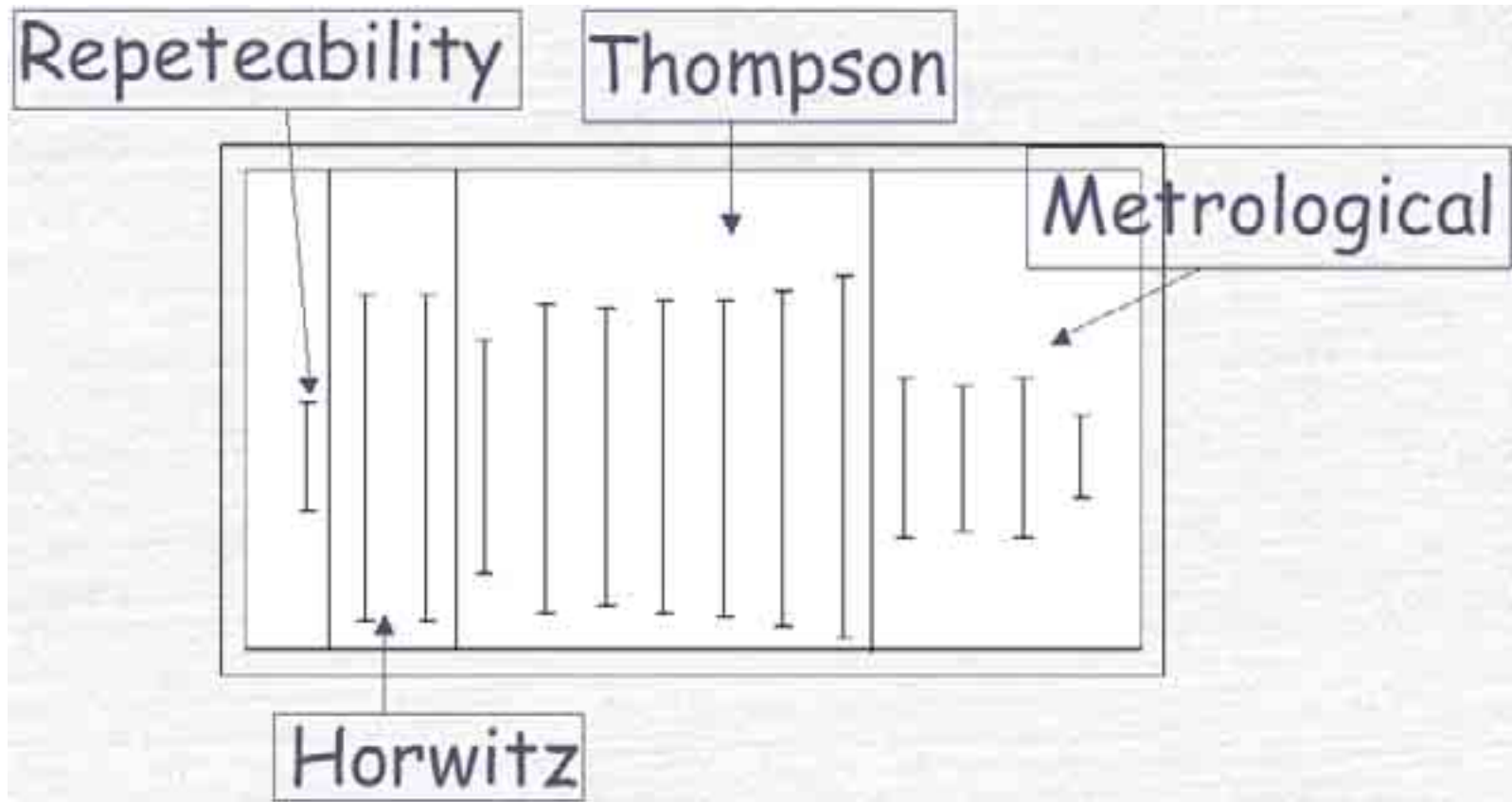
Network of reference laboratories

Network of reference laboratories



All laboratories

Network of reference laboratories



Network of reference laboratories

a fit for purpose harmonization of method for uncertainty assessment is urgently needed

Collaboration with the National Metrology Institute (INRIM)

- traceability chain for ozone measurements with the
- involvement of all ARPAs/APPAs
- theoretical and practical training courses on
- traceability of measurements
- mass determination
- pH
- conductivity
- gas measurements (air quality)
- ozone measurements