Instruments and Methods of Observation Programme, the Report of the President of CIMO

Report to Cg-XV
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President of CIMO

CIMO Mission

To promote and facilitate international standardisation and compatibility of meteorological observing systems used by Members within the WMO Global Observing System to improve quality of products and services of Members.

Aim of CIMO intercomparisons

- To improve the **quality** and **cost-effectiveness** of surface based and upper air observing systems by exploiting existing national tests and performing global intercomparisons;
- To provide recommendations on **system performance**, **improvements** of instruments and methods of observation, suitable working **references** to WMO Members and instrument manufacturers.

CIMO Strategy

- Support initiatives which by coordinating **collective actions** by Members with respect to observing systems produce **results that exceed** what each Member could produce unilaterally to meet their critical needs;
- Support **capacity building** in developing and least developed countries to close the gap between them and the developed countries;
- Support **development** of new observing equipment, critical to Member's needs, collaborating with members of HMEI , the scientific community and other developers to facilitate a production of reliable instruments that are adequately tested before use.

Key Challenges

- Improving **sustainability** of observing systems;
- **Integrating** remote sensing and in-situ observing systems;
- Monitoring in **severe** weather/climate conditions;
- Improving Weather radar calibration and evaluation of algorithms (**QPE**);
- Development of technical **expertise**.

Achievements - Standardization & Compatibility

1. Three WMO **instrument intercomparisons** conducted (2 others will start in July 07);
2. 17 **technical reports** related to standardization published;
3. 7th Edition of the ***CIMO Guide*** in print
4. Promoting the **Quality** of measurements through concepts of:
    1. Traceability of measurements to SI standards;
    2. Regional Instrument & Radiation Centres;
5. **Advice** to Members to sustain the observations

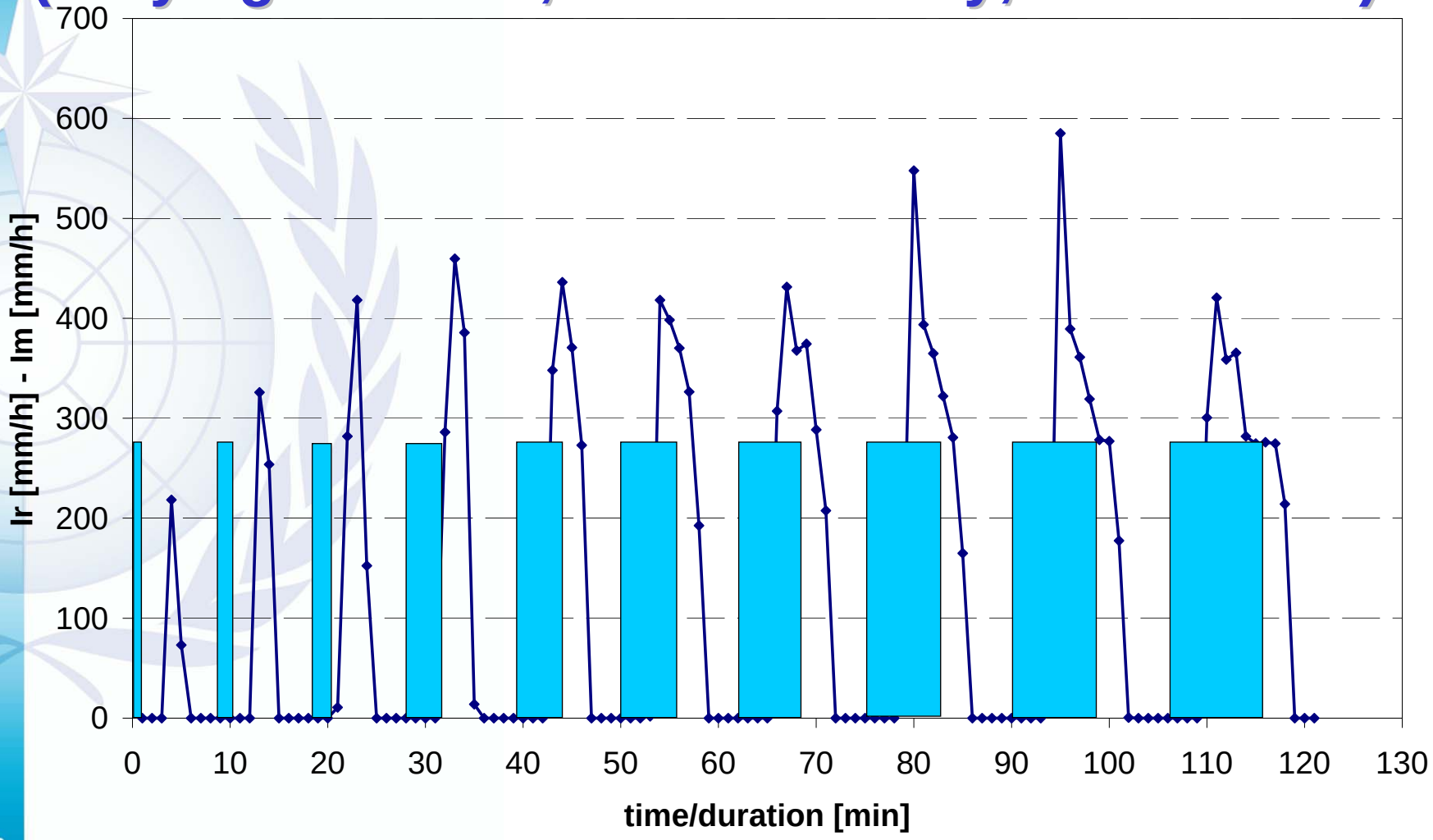
Laboratory Intercomparison of Rainfall Intensity (RI) Gauges
(De Bilt-Genova-Trappes, Sep04-Sep05)

Unique results achieved and published ☑

- Error **characteristics** of 19 RI gauges
- A **standardized procedure** for laboratory calibration of catchment type rain gauges
- **Reference** for the field tests/comparisons
- Guidelines for improving the **homogeneity** of rainfall time series of high intensity

LABORATORY SIMULATION OF INTERMITTENT RAINFALL

(Varying duration, same intensity,1-min resol.)

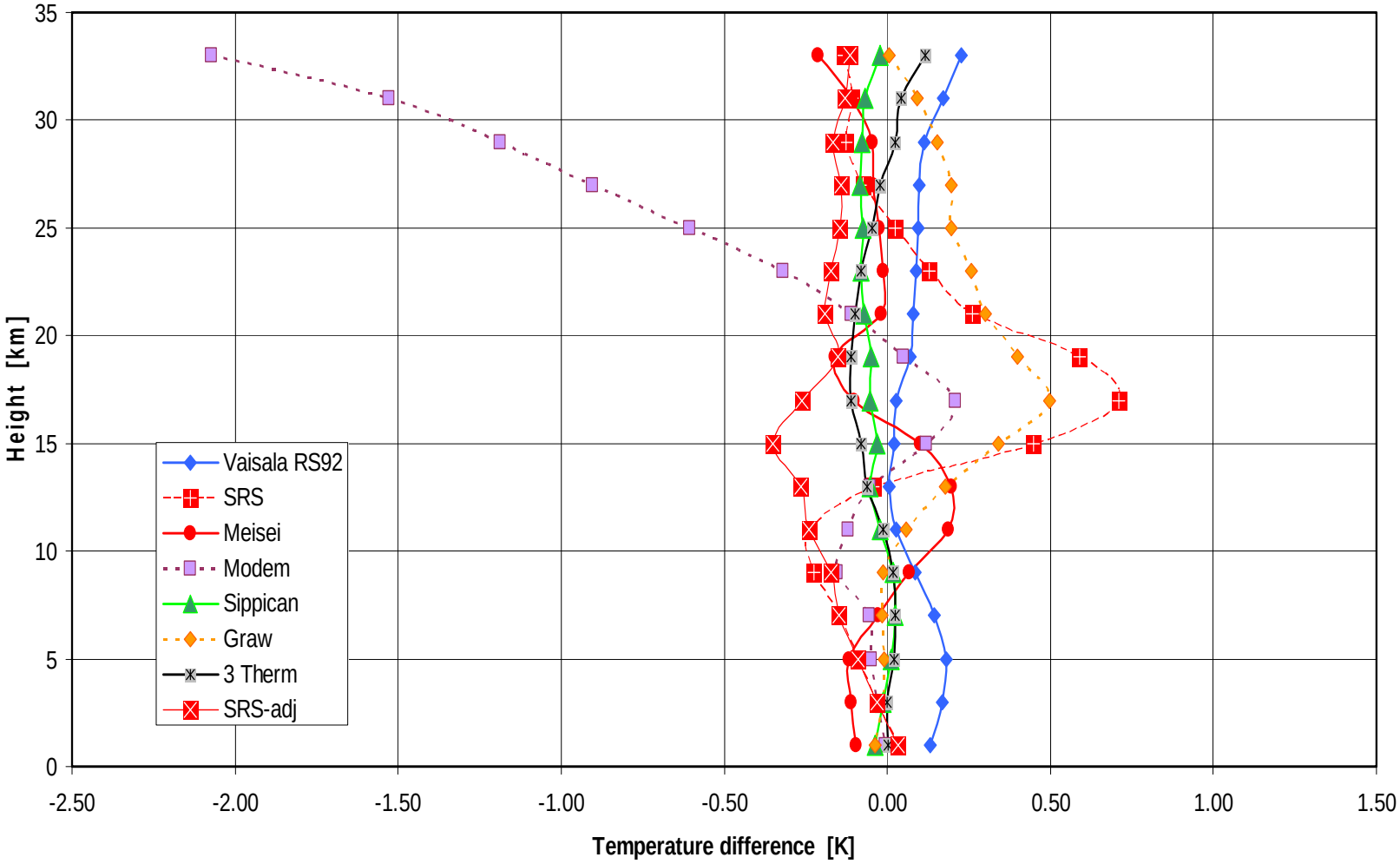


Intercomparison of High Quality Radiosondes (Vacoas, Mauritius, 1-27 February 2005)

Unique results achieved and published

- Error **characteristics** of 6 Radiosonde Systems
- **Improved** accuracy of all radiosonde Systems
- **Usefulness** of geopotential height derived from the geometric height measured by GPS Radiosondes
- Best combination of Radiosondes for "**reference**" purposes

Systematic differences in nighttime temperature
referenced to the average of Graw, Meisei, Sippican, SRS-adjusted and Vaisala
WMO High Quality Radiosonde Comparison Test, Mauritius 2005



Progress in improving the quality of radiosonde temperatures as a result of six intercomparisons

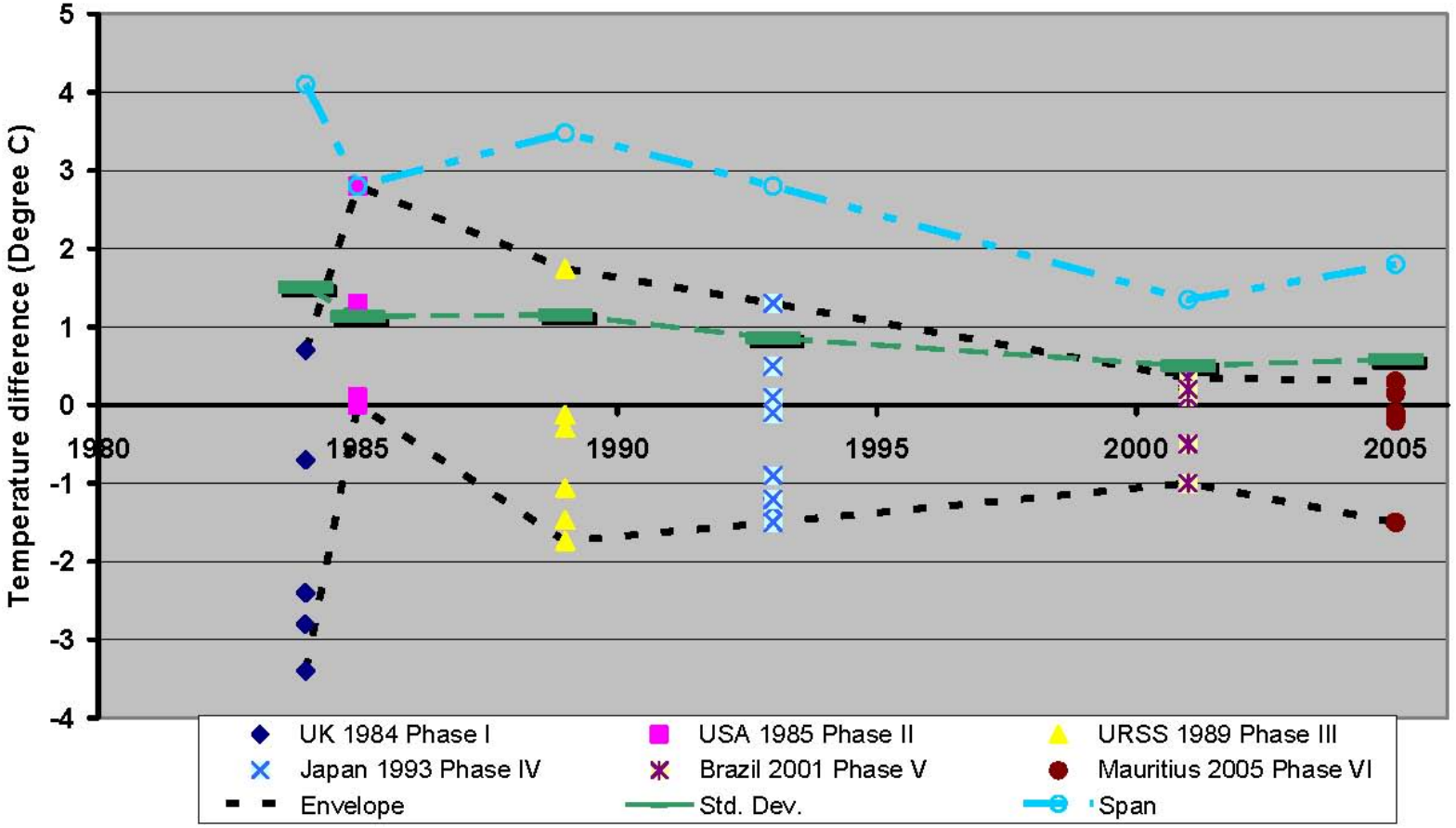


Figure 5. Night-time temperature bias around 10 hPa for the six WMO Radiosonde Comparisons (simultaneous measurements). The two dotted lines represent the envelope of all individual results, which is converted into a span with the dash-dotted line.. The horizontal green bars on the dashed green curve correspond to one standard deviation of the biases of each comparison.

10th International Pyrheliometer Comparison
(Davos, Switzerland, 26 Sep- 14 Oct 2005)

Objectives achieved and Results published ☑

- 89 pyrheliometers from 16 RRCs, 23 NRCs and 5 International Institutions calibrated;
- WRR factors transferred to participating instruments from the World Standard Group of 6 absolute pyrheliometers.

Capacity Building & Training

- Training **programme developed** according to CIMO Strategy to address major gaps impacting quality of data ☑
- Training **lectures developed** and published as IOM Reports ☑
- **235** observers and technicians **trained** through 10 workshops on Upper-air Observations, and on Metrology & Calibration (traceability) ☑

FUTURE PLANS #1

1. **To continue with current CIMO training programme in all Regions:**
   - Training Workshop on UA Observations
   - Training Workshop on Metrology & Calibration (traceability)
2. **Implement urgently needed instrument intercomparisons:**
   - WMO Combined Intercomparison of Thermometer Screens/Shields and Humidity Instruments (Ghardaïa, Algeria, 2007-2008)
   - WMO Field Intercomparison of RI instruments (Vigna di Valle, Italy, mid 2007 – mid 2008)

FUTURE PLANS #2

3. Increase quality of products and services of NMHSs through enhanced quality of measurements:

- Establish worldwide quality assurance (QA) system that would guarantee quality measurements within the International System (SI) standards;
- Promote the role of the RICs & RRCs as a core function in the above QA system;
- Establish CIMO Lead Centre(s) for instrument development & testing;
- Establish CIMO Test Beds for integration of in-situ and remote sensing observing systems