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COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION
OPAG-UPPER-AIR

JOINT MEETING

CIMO EXPERT TEAM ON UPPER-AIR SYSTEMS INTERCOMPARISONS
First Session

AND
INTERNATIONAL ORGANIZING COMMITTEE (IOC) ON UPPER-AIR SYSTEMS INTERCOMPARISONS
First Session

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PRESENTATIONS ON RECENT NATIONAL TEST / COMPARISONS

Russian Activities in Radiosonde Comparisons

(Submitted by Alexey Ivanov, Russia)

Summary and purpose of document

This document provides information on the recent comparisons and testing quality of radiosondes, including requirements for further tests developed by the Russian Central Aerological Observatory

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Action proposed

The meeting is invited to take the report into account in discussion under agenda item 3 and, in particular, under items 3.2 and 3.4

Russian activities in radiosonde comparisons

1. Operational radiosondes

Problem of direct comparisons of MRZ3 and newer RF95 radiosondes, being operated on the Russian network, is still actual – not only for the economical, but for the technical reasons as well, they are difficult to implement. Therefore indirect methods of comparison, using e.g. results of data quality monitoring or consecutive alternating ascents, had to be used so far. This might be the case for other hydrometeorological services, so relevant recommendations for such instances from this Expert Team will be appreciated. In meanwhile, it is tested a potential possibility for the direct comparisons, using as a receiving system for MRZ-3 one of MARL radars, that periodically undergone their pre-installation tests in CAO, Dolgoprudny. Several twin ascents have been conducted that proved practicability of the approach. Now, sufficient statistics has to be collected.

2. Data processing systems

ET-UGRN started the study of consistency of coding algorithms to access compatibility of automatically coded TEMP messages, initiated with participation of Russian Federation. Besides investigation of codes, comparison of their outputs, derived from simulation experiments, is also essential, therefore support and coordination with ET-UASI is appreciated. Another similar activity, undergoing in Russian Federation, is the direct comparison of output from two different alternative (i.e. using different hardware and software) PC-based data processing systems, connected to the same ground system. Results are being analyzed.

3. Special comparisons

Representatives of Russian Federation took part in LAUTLOS - WAVVAP (LAPBIAT Upper Troposphere Lower Stratosphere Water Vapor Validation Project) measuring campaign, Sodankyla, Finland, in February 2004. They operated Meteorological hygrometer FLASH-B (balloon version). As well, Mr. A. Kats was participated as invited expert to assist in data base management and express data evaluation. Other instruments participated were: NOAA-CMDL frost point hygrometer (old one and new modification), Meteolabor Snow White hygrometer, Vaisala RS80A, RS80H, RS90 and RS92 radiosondes and FN-sonde (based on research version of RS90) from Lindenberg Observatory, DWD. There were made more than 30 flights with simultaneous measurement during ascent and descent. It is expected that data verification will take about 3 months and the total time for the evaluation will take about one year. There were several similar projects in the recent past (e.g. the IHOP2002 (International H20 Project) Field Campaign, May - June 2002, and AWEX - AIRS Water Vapor Experiment – Ground, October 27 - November 16, 2003). Better cooperation with research community is necessary to bring the results of such experiments to CIMO community and promote long-term proven procedures of WMO instrument intercomparison, developed for reliability of results.

One specific example of such activity is undergone in Russia MTP radiometer – radiosonde temperature comparison that advances more deep investigation of conventional radiosonde shortcomings in boundary layer.

4. Comparison procedures

LAUTLOS campaign provided an interesting experience of obtaining simultaneous measurements of tested instruments using synchronization of data acquisition computers' time from local network timeserver (freeware AboutTime was used as client software) instead of traditional coordinated time stamp. Under proper implementation such practice may relieve procedures of launch of flight rig. From other side, preliminary (pre-campaign) evaluation of data processing software timing practices is required and uniform procedures of using client software (settings, user privileges etc.) are mandatory. As well, such method is not suitable for those systems that provide for the measurements elapsed ascent time, using relative timing – doesn't matter from manual or automatic start.

5. Evaluation software

Despite of promotion, made by ET-UGRN members Dr. U. Leiterer and Mr. A.Kats for use of WRSKOMP software as basis for data evaluation during LAUTLOS campaign, host side was unable to use it due to high price. As well, from evaluation of provided by Mr. S. Kurnosenko demo version latter it was found some shortcomings for its use for this particular comparisons due to their specific features: synchronization using absolute UTC, measurements during descents, necessity for additional calculus (from "Recent Development of
WRSKOMP Radiosonde Comparison Software" document the latter feature seems to be already implemented) and due to interface, unusual for people having no experience of working with RSKOMP DOS-version. Therefore, additional software for the express data evaluation had to be developed "in the field" with one useful feature – ability to import data from each instrument specific "user data file" that might be useful to have in WRSKOMP. It looks that both developer of WRSKOMP and CIMO may benefit if further WRSKOMP development will go in interactive cooperation with CIMO community and Russian Federation is ready to contribute.
To make WRSKOMP procurable it might be practical if some parts of WRSKOMP could be sold separately rather than complete package and consider possibility of its use on time limitation basis.

6. Comparisons data bases

Besides of official reports and relevant publication the measurements data themselves may have self-sufficient significance both of their meteorological value and for better understanding of participating instruments behavior. It might be useful to keep relevant databases in one of WDC, may be NCDC due to their historical importance. However, there no common rules for data formats and presentation of specific metadata. Moreover, since WMO Radiosonde Intercomparison Phase III, databases were stored in internal RSKOMP format (also undergone modifications since that times). As a successor of host country of WMO Radiosonde Intercomparison Phase III Russian Federation is interested in recommendations how to make available relevant database for meteorological and research community.