WMO OMM

World Meteorological Organization
Organisation météorologique mondiale
Organización Meteorológica Mundial
Всемирная метеорологическая организация
المنظمة العالمية للأرصاد الجوية
世界气象组织

WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

Secrétariat
7 bis, avenue de la Paix – Case postale 2300
CH 1211 Genève 2 – Suisse
Tél.: +41 (0) 22 730 81 11
Fax: +41 (0) 22 730 81 81
wmo@wmo.int – public.wmo.int

Form for
Regular Reporting of CIMO Testbeds and Lead Centres

(expand the cells as required to properly reflect your activities)

Terms of Reference for CIMO Testbeds and Lead Centres are available under:
ttp://www.wmo.int/pages/prog/www/IMOP/Testbeds-and-LC.html

Name of Testbed / Lead Centre	**Lindenberg Meteorological Observatory – Richard-Aßmann-Observatory (Deutscher Wetterdienst – DWD, German Meteorological Service)**
Location of Testbed / Lead Centre	**Lindenberg / Germany**

Contact Person for the Testbed	
Courtesy Title	**Mr Dr**
Family name	**Berger**
First name	**Franz H.**
Full Postal Address	**Am Observatorium 12** **15848 Tauche – OT Lindenberg**
Country	**Germany**
Tel. number(s)	**+49 69 80625700**
Fax number(s)	**+49 69 80625710**
Email(s)	**franz.berger@dwd.de**
Has contact person changed in last 2 years?	Yes
If yes, who was the previous contact person?	Dr Frank Beyrich

Report on Activities

Main activities that TB carried out in the last 2 years for which results are already available:

- Contribution to an uncertainty assessment of integrated water vapour estimated from GNSS observations within the frame of GRUAN
- Simultaneous operation of two IR Doppler wind lidar instruments in different scanning modes, assessment of the influence of the number of beam directions on the uncertainty of the derived wind vector (contribution to COST-ToProf final report)

- Assessment of different types of photometers and spectroradiometers for the retrieval of AOD and Precipitable Water Vapor (PWV)

Main activities that TB carried out in the last 2 years for which results will soon be available:

- Data analysis of the CeiLiNex-2015 laser ceilometer intercomparison campaign (operation of 12 laser ceilometers, 6 different types from 3 manufacturers) for cloud detection and aerosol profiling
- Evaluation of cloud radar measurements in relation to the formation, depth, and dissolution of fog / low stratus cloud layers
- Assessment and modification of an algorithm to derive cloud fraction from ceilometer measurements using data from more than one operational system at airports
- Climate chamber / radiation error characterization of Vaisala RS41 radiosondes
- Calibration of FLASH-B stratospheric hygrometer, intercomparison with CFH reference instrument
- Preparation of an internal DWD project aimed at testing a complex of modern remote sensing instruments under conditions of routine network operation ("ground-based remote sensing pilot station")

Which guidance documents/standard procedures were developed during the last 2 years (please include full reference and web-link if available)?

- Contribution to CIMO guide, chapter 5.2.2. "Wind profiler radars" (submitted to WMO-CIMO in Dec., 2017)

Which IOM reports / peer-reviewed publications were published in the last 2 years (please include full reference and web-link if available)?

- Ning, T., J. Wang, G. Elgered, G.Dick, J. Wickert, M. Bradke, M. Sommer, R. Querel, D. Smale, 2016: The uncertainty of the atmospheric integrated water vapour estimated from GNSS observations. *Atmos. Meas. Tech.* **9**, 79-92. doi:10.5194/amt-9-79-2016
- Vömel, H., T. Naebert, R. Dirksen, and M. Sommer, 2016: An update on the uncertainties of water vapor measurements using cryogenic frost point hygrometers. *Atmos. Meas. Tech.* **9**, 3755–3768, doi:10.5194/amt-9-3755-2016
- Calbet, X., N. Peinado-Galan, P. Ripodas, T. Trent, R. Dirksen, and M. Sommer, 2017: Consistency between GRUAN sondes, LBLRTM and IASI. *Atmos. Meas. Tech.* **10**, 2323–2335, doi:10.5194/amt-10-2323-2017
- Teschke, G.; V. Lehmann, 2017: Mean wind vector estimation using the velocity–azimuth display (VAD) method: an explicit algebraic solution. *Atmos. Meas. Tech.* **10**, 3265-3271, https://doi.org/10.5194/amt-10-3265-2017
- Weisshaupt, N.; V. Lehmann; J. Arizaga, M. Maruri, 2017: Radar wind profilers and avian migration: A qualitative and quantitative assessment verified by thermal imaging and moon watching. *Methods Ecol. Evolution* **8**, 1133-1145, doi: 10.1111/2041-210X.12763
- Raptis, P.-I., Kazadzis, S., Gröbner, J., Kouremeti, N., Doppler, L., Becker, R., and Helmis, C, 2018.: Water vapour retrieval using the precision solar spectroradiometer, *Atmos. Meas. Tech.* **11**, 1143-1157, https://doi.org/10.5194/amt-11-1143-2018

Title(s) of IOM report(s) presently being developed by your Testbed:
(please specify level of development: draft, ready for review, …)

- none

Has your Testbed collaborated with one or more CIMO Expert Teams in developing guidance material? Yes

If yes, with which CIMO Expert Team(s)?

CIMO ET-ORST (B.1), CBS ET-SBO

Capacity Building and Training Activities

Which capacity building/training activities have been carried out by the Testbed in the last 2 years?

- Training of personnel in preparation and operation of Cryogenic Frostpoint Hygrometer (CFH) at Maïdo Observatory (Reunion Island), Nainital (India), Kathmandu (Nepal)

Has your testbed developed a twinning activity / special relationship with a companion station/site from a developing country? No

If yes, with which station/site?

Does not apply

Is your Testbed/Lead Centre making an oral/poster presentation at this year's TECO? Yes / No
(If yes, please specify Title(s) and Author(s) of the presentation(s))

- Intended, decision TBD in response to the call for papers

Recent Changes in Circumstance

Have there been any recent changes in your Test Bed capabilities? If so, please specify:

- No relevant changes

Have there been any recent changes in your Test Bed infrastructure? If so, please specify:

- New experimental set up to measure the radiation error of radiosondes
- Refurbishment of calibration set up for FLASH-B optical balloonborne hygrometer

Have there been any recent changes in your staffing? If so, please specify, and advise whether replacement staff have the required competencies:

- Several changes in scientific and technical staff over the past two years, new staff members carefully selected to obey the competences needed for running testbed tasks at high standard, several scientists that were previously working on project money at MOL-RAO could be hired as permanent staff members

Future Plans

What are your plans for the next two years?

- Hosting of the next (9^{th}) WMO-CIMO Intercomparison of high-quality radiosondes campaign (in 2019)
- Assessment of nocturnal moon spectroradiometer measurements to determine AOD and PWV / determination of nocturnal AOD and PWV by combining moon and star photometer measurements → Realization of an international moon photometer intercomparison campaign
- Testing of newly available ground-based remote sensing systems for thermodynamic profiling (within the frame of the DWD project "ground-based remote sensing pilot station"
- Further studies to characterize the quality and uncertainty of Doppler lidar wind measurements

Is your Testbed/Lead Centre able to continue in the role of a Test Bed/Lead Centre during the coming two years?	**Yes**

Other relevant information (other activities of special interest to CIMO, etc…)
• none

14.03.2018	Frank Beyrich (on behalf of Franz Berger)
Date	**Name of Person Filling the Form**