

WMO-CIMO Lead Centre on Evaluation of Precipitation Measurement Accuracy - Chupungnyeong (Republic of Korea)

General Site Information

"The regulation for the management of the standard meteorological observatories" was enacted and this site was designated as Korean Standard Weather Observatory for sensor performance testing and intercomparison observation by Korea Meteorological Administration (KMA) in 2008. Afterwards, Chupungnyeong is the core observatory for the KMA's standardization project. Additionally, another standard meteorological observatory was established in 2010 under the MOU between KMA and the local government of Gochang-gun. Chupungnyeong and Gochang sites are closely linked to the KMA's Standardization Project. Gochang is located at the west coast of Korea, which is characterized with several heavy snow events, caused by the cold surge over the Yellow Sea, and is to be considered as a part of Chupungnyeong as the WMO CIMO Lead Centre.

Since 2009, KMA has been in charge of the WIGOS Demonstration Project in WMO RA II region of "Establishment of a Common Information Infrastructure for Meteorological Observation Data" which aims at the integration and co-use of meteorological observation data produced by diverse domestic agencies. There were several intercomparison experiments, such as:

- Investigation of the wind screen effect for the rain gauges,
- Experimental operation of weighing precipitation gauge: Double Fence Intercomparison Reference (DFIR) and Pit Gauge,
- Collaboration international activity: WMO Solid Precipitation Intercomparison Experiment (SPICE).

Lead centre location: 36.22°N, 127.99°E

Climate type: Dwa (hot summer continental climate)

Contact person: Dr Young-San Park

Email: sanpark@korea.kr

Address: National Institute of Meteorological Sciences
385, Deungnyangman-gil, Deungnyang-myeon, Boseong-gun,
Jeollanam-do, 59438,
Republic of Korea

Tel: +82-61-852-1851

Fax: +82-61-852-4297

Website: N/A

Main activities and competences

In-situ meteorological observation

- The main purpose of the lead centre is to perform the laboratory testing of individual weather sensor performance supporting KMA's Standardization Project.
- All the in-situ meteorological observing equipment used in Korea is tested and compared with the reference instruments. The performance reports of the equipments of KMA and other institutes are issued and available for the operational use.
- Based on its long operational history and several years of intercomparison, the lead centre provides its expertise on the guidance for daily operation of weighing and tipping bucket rain gauges.

Field experiments for the newly developed instruments

- The lead centre performs field experiments for a trial transition of the state-of-the-art observing equipment into daily operations (such as sunlight shields, ultrasonic wind speed/direction sensors, weighing precipitation gauges).
- Field testing of automated weather systems using ubiquitous sensor network (USN) technology is carried out at this lead centre.
- The lead centre provides the opportunities for joint use of the laboratories for the commercial weather sensor manufacturers, enabling the improvement and development of new sensors.

Intercomparison campaigns

- The lead centre is willing to provide their expertise and infrastructure for the intercomparison experiments to domestic and foreign scientists in order to validate their instruments' performance.
- These activities improve WMO members' observational infrastructure capability through intercomparison and training opportunities jointly coordinated by the CIMO expert team and sensor providers.
- The results can help to develop standardized guidance through weather sensor performance testing and field experiments, and to contribute to WIGOS development plan.

Infrastructure description

The Chupungnyeong site

The Chupungnyeong site consists of following facilities for testing of instruments' performance:

- Pit gauge: equipped with weighing precipitation gauge,
- 10 precipitation gauges available for comparison,
- Double Fence Intercomparison Reference (DFIR),
- Parallel observing platform for anemometer or multisensor intercomparison,
- Automated synoptic observing system (ASOS) [three 10-meter observing towers, four 2-meter towers],
- Radiation measuring equipment: three types of trackers and reference radiometer PMO6,

Laboratory includes:

- Reference equipment for temperature, humidity, precipitation, and radiation,
- Calibration system for precipitation (Weighing and Burette type gauges), temperature, humidity, and radiation.

The Gochang site

Infrastructure available at the Gochang site is:

- Pit gauge: equipped with weighing precipitation gauge
- 10 precipitation gauges: weighing type and tipping bucket type gauges,
- 2 DFIRs (Double Fence Intercomparison Reference),
- Automated synoptic observing system(ASOS),
- Automated snow depth gauges:
 - two sets of ultrasonic snow depth gauges,
 - three sets of laser snow depth gauges,
 - one set of optical snow depth gauge,
 - three snow plates for manual measurement and CCTV monitoring,
- Nine 3-meter towers for temperature, humidity, wind speed and direction, multisensor, etc.,

Laboratory includes:

- Precipitation gauge calibration system (weighing type).

Publication list

Technical Report

- Results of comparison between 3 cup and ultrasonic anemometer in Chupungnyeong.
- Calibration guideline for pyranometer.
- Operation manual and intercomparison results of snow depth monitoring CCTV.
- Operation guideline for temperature calibration equipment.
- Intercomparison results of snow depth sensors in Gochang.
- Intercomparison results of evaporation in Gochang.

R&D Project Report

- A research on intercomparison tests of meteorological sensors.
- A research on intercomparison tests of meteorological sensors and improvement of solar radiation network.
- Enhancement of verification/calibration techniques of meteorological instruments.
- Development of evaluation techniques for the accuracy of precipitation observation.

TECO

- WMO Solid Precipitation Intercomparison Experiment (SPICE): Overview and results of Gochang site.
- A multipoint snow depth measurement system.
- Precipitation gauge: application of an ultrasonic flow measurement technique.