

WMO-CIMO Testbed for Integration of 3D Weather Observation System (Boseong, Republic of Korea)

General Site Information

The basic purpose of Boseong site is to conduct the state-of-the-art 3D weather observation. National Institute of Meteorological Sciences (NIMS) of KMA has been operating the National Center for Intensive Observation of Severe Weathers at Haenam site about 40km west of Boseong since 2000. Based on Haenam site, NIMS/KMA has collaboratively participated in THORPEX/T-PARC by performing several intensive field campaigns. All the facilities of Haenam site were moved and merged into Boseong facilities in 2010. And, the tall tower has been constructed in December 2013.

As a part of KEOP (Korea Enhanced Observing Program) activities, the testbed has participated in:

- CAMP (CEOP Asia-Australia Monsoon Project, 2001),
- IUAFEX (Intensive Upper-Air & Flux Field Experiment, 2002),
- T-PARC (THORPEX-Pacific Asia Regional Campaign, 2003),
- International Field Campaign for Typhoon Observation (2008).

As a WMO-CIMO Testbed for the Integration of 3D Weather Observation System, KMA is willing to provide one of the best practices of validation for the ground based measurement and the state-of-the-art remote sensing techniques.

Testbed location: 34.76°N, 127.21°E

Climate type: Cwa (humid subtropical climate)

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Main activities

Areas of special interests and capabilities

Testbed for the state-of-the-art 3D Weather Observation

The testbed's ability for 3 dimensional observation is based on:

- the previously available ability of 3 dimensional observations at the observatory of Haenam.
- a newly-built tower of 300m high with attached instruments of several sets of wind observing equipments, such as conventional and ultra-sonic anemometer.

This field measurement and future intercomparison:

- will contribute to establish the standard guideline for the future wind observation from boundary layer to the upper air.
- will greatly contribute to the calibration of precipitation rate estimation scheme.

Measurement	Instrument	
Basic meteorological variables and atmospheric sounding	Vaisala radiosonde observation system	aerological measurement
Precipitation rate	OSI optical rainfall rate sensor, Disdrometer	surface-based remote sensing
Vertical profiler of hydrometeors; Doppler spectra; Rain rate and liquid water content	METEX GmbH micro rain radar	
Vertical profiles of temperature, Humidity and cloud in lower troposphere	Radio Metrics microwave radiometer	
Vertical profile of cloud	Ka-band 35.5GHz MIRA36 cloud radar	
Cloud height and amount	Ceilometer (Jenoptik, Vaisala)	
Visibility	Vaisala Visibility meter	
Basic meteorological variables and soil temperature/moisture	Jinyang Automatic Weather System	
Temperature, relative humidity and 2D wind	Sensors at 11 levels	Instruments implemented on the 11-level 300-metre tower
Wind speed and direction	3-cup and aerovane at three levels	
3D wind speed and direction	Ultrasonic anemometer at five levels	
Gas concentration	Infrared gas analyzer at three levels	
Pressure	Barometer at three levels	
Thermal radiation flux	Net radiometer at three levels	
Soil moisture	Cosmic-ray probe at one level	
Precipitation rate	Disdrometer at one level	

Field Campaigns for the Research of Severe Weather

This testbed:

- was the base of KEOP (Korea Enhanced Observing Program) during 2001~2008.
- is exploring the synergy of collectively using micro rain radar, cloud radar, and the conventional weather radar.
- is working on the guidance for monitoring the interpretation of the water vapor at the upper air.

Experimental Site for climate monitoring

Boseong site plans to be one of the best platforms for climate and environmental monitoring taking advantage of:

- current configuration of instruments.
- a carbon tracking system for verification of the national and regional greenhouse gas inventory.
- a national standard agricultural weather observation site at the same location.
- a 300-metre-tall tower implemented with various equipments for the monitoring of micro meteorology, air pollution, and radiative flux at different levels.
- the synergy of data integration with another KMA site at Anmyeon site at the west coast of Korea.

Cooperation with domestic institutes or observation sites will be coordinated by the Observation Policy Division of KMA in order to enhance the capability of Boseong site. NIMS is conducting the research based on the measurements from Boseong site. The outcome would be incorporated into the IOM reports.

Publication list

- Study on the local circulation using the data of the Boseong tall tower I, II (Report in Korean).
- Development of application technique of the Boseong tall tower: I. The observation system (Technical Note in Korean).
- Application and operation of the drone which loaded the radiosonde sensor (Technical Note in Korean).