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SUBMITTED ABSTRACT

0.	Paper Number	30
	Session Name	1. Characterization and standardization of environmental measurements - traceability assurance
1.	Title of the paper	Development of upper-air simulator for the calibration of radiosondes

2.	Institution	Korea Research Institute of Standards and Science			
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4.	Abstract of the paper
	<p>Currently radiosondes are being tested in the ground level laboratories at atmospheric pressure without solar radiation for the calibration of temperature and humidity. However, temperature sensor under the solar radiation at high altitude under low pressure is believed to behave differently from the ground condition. In order to perform accurate calibration in the laboratory with traceability to the measurement standard, it is necessary to imitate the upper-air conditions. To simulate the upper-air temperature, a very big size of constant climate chamber operating -75 °C to 180 °C was prepared. Within the chamber, a pressure-controlled test cell was placed and the radiosonde was tested to 1 kPa. Dry air with dew point down to -70 °Cdp flowed to the test cell at specific temperature and pressure, and the air flowrate simulating ventilation effects was controlled from 0.5 m/s to 5 m/s using sonic nozzles below atmospheric pressure. To simulate the solar radiation ranging up to 1500 W/m², a solar beam guide was installed and the controlled solar beam was irradiated to the radiosonde temperature sensor via the quartz plate window attached to the test cell. Temperature measurements were done through the RF communication between a radiosonde installed inside and an RF receiver outside the climate chamber. In this presentation, we will show the constructed upper-air simulator and the test results of radiosondes on Vaisala RS41 and KRISS DTR, which is a newly developed radiosonde having in-situ solar correction technology during flight.</p>