

Replacement of CH₄ calibration system for WCC-JMA

Teruo Kawasaki¹, Masamichi Nakamura¹, Kazuyuki Saito¹, Shinya Takatsuji¹, Kentaro Kozumi¹, Syuichi Hosokawa¹, Haruka Koda¹, Hidekazu Matsueda², Yousuke Sawa², Kazuhiro Tsuboi² and Yosuke Niwa²

¹ Japan Meteorological Agency (JMA), Tokyo, Japan tr_kawasaki@met.kishou.go.jp

² Meteorological Research Institute (MRI), Tsukuba, Japan

The Japan Meteorological Agency (JMA) serves as the World Calibration Centre (WCC) for methane (CH₄) and the Quality Assurance/Science Activity Centre (QA/SAC) in Asia and the South-West Pacific within the framework of the Global Atmosphere Watch (GAW) Programme of the World Meteorological Organization (WMO).

Since the WCC-JMA was established in 2001, the methane calibration system using a gas chromatograph equipped with a flame ionization detector (GC/FID) has been used for analysis of CH₄ mole fractions of standard gases. In consideration of the recent advances in measurement techniques and the widespread use of instruments based on laser spectroscopic techniques at many measurement stations, the WCC-JMA plans to replace the current GC/FID with a wavelength-scanned cavity ring-down spectroscopy (WS-CRDS) analyzer which has some clear advantages concerning sensitivity, precision, linearity, time response and the measurement setup.

In order to assess the consistency in the continuity of the CH₄ calibration, we examined the standard gases and atmospheric CH₄ mole fractions calibrated/measured by both the GC/FID and WS-CRDS analyzers. We report our new calibration system and the results of comparative measurements between the old and new calibration systems.