(48-240329-B) **Overview of the World Meteorological Organization Global Atmosphere Watch Central Calibration Laboratory for Greenhouse Gases**

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The NOAA Global Monitoring Laboratory (GML) is a Central Calibration Laboratory (CCL) for the World Meteorological Organization (WMO) Global Atmospheric Watch (GAW) program. As a CCL, we operate, maintain and distribute the mole fraction scales for carbon dioxide (CO_2), methane (CH_4), carbon monoxide (CO), nitrous oxide (N_2O), and sulfur hexafluoride (SF_6). In addition to supporting GAW, we provide gas standards to collaborators who require high quality ambient level standards for greenhouse gas studies and instrument calibration. This involves the filling of aluminum cylinders with clean continental air from Niwot Ridge, Colorado. The cylinders are then analyzed at GML on dedicated instruments and subsequently shipped to customers with dated calibration certificates. To maximize the long-term calibration consistency, we maintain secondary and tertiary standards that are linked to the primary standards. This allows us to preserve the primary standards for decadal time scales. For example, the NOAA CO_2 primary standards date back to the mid 1990s. Routine analysis of target air cylinders allows assessment of tertiary value assignments. Links to National Metrology Institutes (NMIs) and other scientific laboratories are established through regular formal and informal comparisons. History and efforts to improve analytical precision and operational efficiency will also be presented.

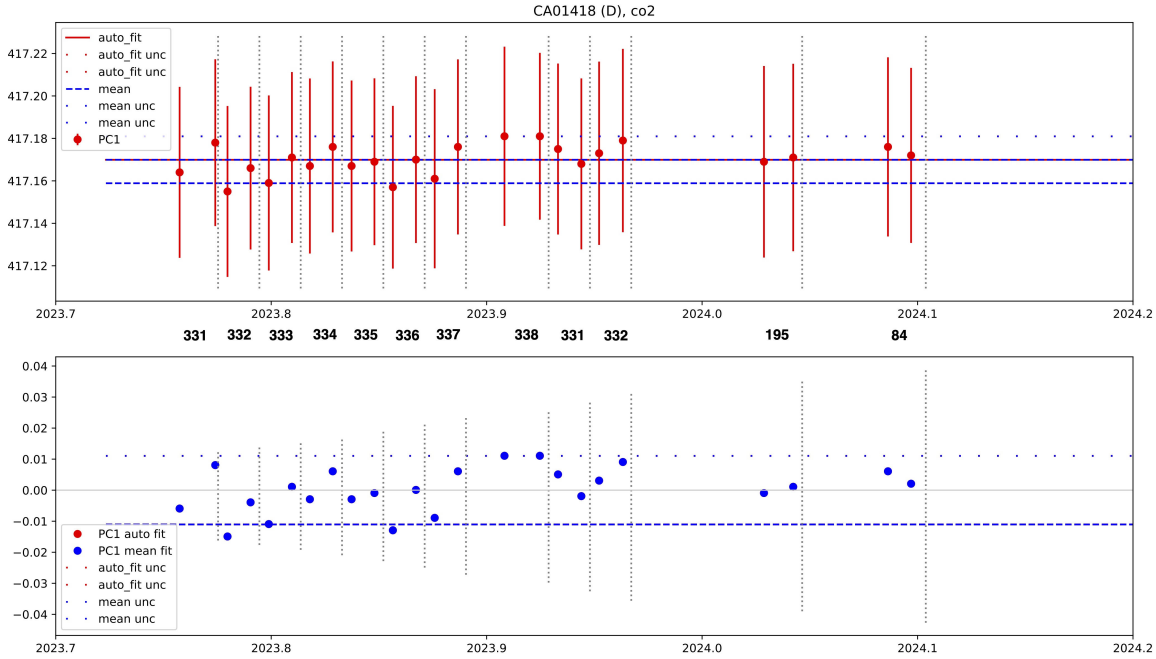

Figure 1. CO_2 mole fraction values and 1-sigma uncertainty values (top) and residuals to the fit (bottom). Vertical axis is CO_2 in ppm. Horizontal axis the date. Bold numbers in the middle are regulator numbers. Regulators 331 – 338 are brand new regulators. Regulators 195 and 84 are older regulators that were used to compare with the new regulators.