

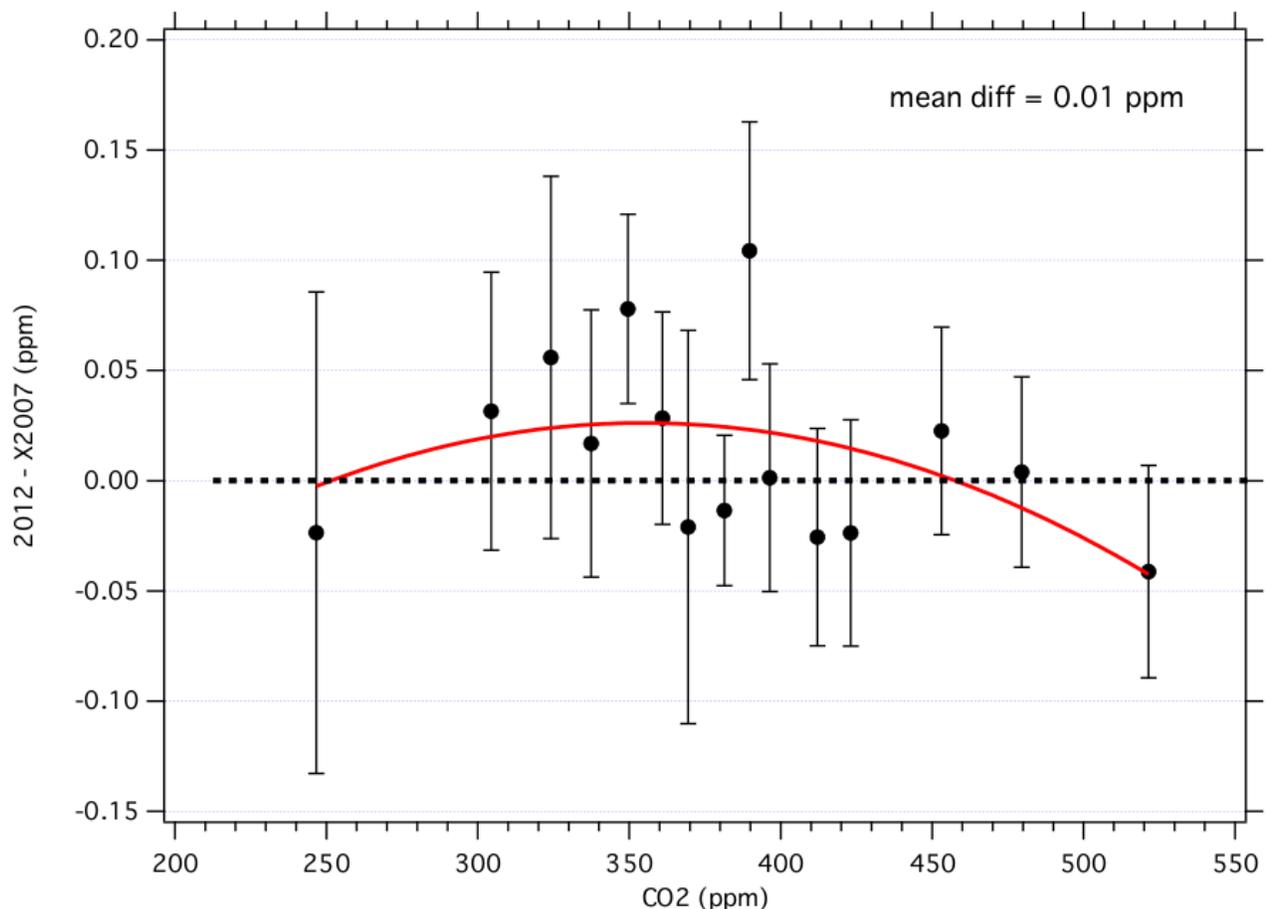
## Recent Analysis of the World Meteorological Organization (WMO) CO<sub>2</sub> Primary Standards

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The WMO mole fraction scale for CO<sub>2</sub> is defined by 15 primary standards, consisting of compressed air stored in aluminum cylinders. Mole fractions of CO<sub>2</sub> range from ~250-520 ppm (mole fraction in dry air). These primary standards serve as the calibration reference for tropospheric CO<sub>2</sub> measurements made by many laboratories worldwide. Since assuming responsibility for maintaining the WMO CO<sub>2</sub> mole fraction scale in 1995, the mole fraction of CO<sub>2</sub> in each cylinder has been determined approximately every two years using the NOAA manometer. The most recent experiment was carried out in 2012-2013. Periodic analysis is necessary to maintain the mole fraction scale and check for potential drift over time. The 2012 experiment was unique in that it was not performed by Conglong Zhao. Conglong Zhao successfully maintained the WMO CO<sub>2</sub> scale for many years. Could the same level of reproducibility be achieved in his absence? Results from the 2012 experiment will be presented along with drift analysis for each primary standard. Directions for future work will also be discussed.



**Figure 1.** Difference (mean and one standard deviation) between the 2012 manometer experiment and mole fractions assigned on the X2007 scale for 15 CO<sub>2</sub> primary standards.