Review of: “The BErkeley Atmospheric CO2 Observation Network: Field Calibration and Evaluation of Low-cost Air Quality Sensors”, by Jinsol Kim, et al.

This paper describes a novel approach to calibrate inexpensive sensor networks. The idea is to use known atmospheric chemistry relationships to constrain correlated measurements and derive corrections or calibrations. The paper is well presented and clear. The figures illustrate the main points well and support the conclusions of the paper. The paper, overall, is well suited to AMT and will make a valuable contribution to the growing area of sensor network research. I recommend publication after a few minor changes.

These issues are listed below. I believe that each of these can be addressed without major changes to the paper.

My overall impression with this approach is that if you know what the measurements should look like you can modify them to match this expectation. The case study does a good job of making this point. The manuscript does not address the alternative case that might not follow the expected chemical relations. The main question that I have after reading this paper is: How well does this approach work under less ideal circumstances? For example, the analysis assumes NOx + Ox is conserved, which is appropriate for being near a point source. How well does this approach work with a sensor that samples multiple sources where NOx + Ox is not conserved? Or, if CO/CO2 is different because of a large diesel presence. In other words, how useful is this approach in general? The answer to this question is a general point that needs to be developed better in the discussion.

Another aspect that should be discussed is the sensitivity of the calibrations to these assumptions. How large are these corrections, typically? If the NOx+Ox assumption is not correct by some amount, how does this impact your calibration? Likewise for CO/CO2.