

Interactive comment on “Calibration and assessment of electrochemical air quality sensors by co-location with reference-grade instruments” by David H. Hagan et al.

Anonymous Referee #1

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This work presents a detailed analysis of the performance one type of electrochemical air quality sensor for SO₂ detection. The authors use data from multiple sensors deployed for approximately 21 weeks and compare with co-located reference-grade SO₂ instruments on the island of Hawaii. The performance of multiple regression methods to calibrate the electrochemical sensors and correct for known temperature responses are evaluated. The availability and interest in low cost sensor technologies over recent years means comprehensive evaluations of their performance and possible sampling methodologies such as this are essential. As acknowledged by the authors, the choice of Hawaii as a sampling location provides the best possible scenario for sensor performance, due to the large dynamic range of SO₂ mixing ratios experienced and the

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lack of any significant interfering co-pollutants. How well the sensors and analytical methods presented in this work would perform in other environments (e.g. urban) is therefore still questionable. The manuscript is clear and well written, and presents one of the most comprehensive assessments of low cost sensor performance to date. I recommend publication after the following minor comments have been addressed.

Minor comments

1. In section 3.5 and Fig. 7 it would be useful to compare with the performance of one of the sensors that remained at the Pahala site that was trained only using data from the same 2 days. Adding this data to Fig.7 would help demonstrate the decreased performance of the regression used for calibration due to environmental parameters compared to the change in training data fraction (changing from 70% in earlier Figs. To <2% in Fig. 7).

Typographical errors

1. Unsure if this was just a problem with my version but Hawaii often spelt Hawai'i
2. Page 16 line 7: Figure ?
3. Page 19 line 12: Figure 7 should read Figure 8

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