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Improvement of low-cost sensor accuracy in challenging environmental conditions to obtain near-reference data

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It is well-known the limitations that low-cost sensors have related to the environmental conditions effect, cross-sensitivities, and drifts over time. Currently, manufacturers apply different techniques to mitigate these limitations, most of them based on Machine Learning and AI models. However, these models have several disadvantages, such as they require a large amount of reference data to train and test the model, being valid in that specific case, and they need additional training to update the model to the new environmental conditions. Currently, LCS have shown data accuracy close to reference instruments, however, it is not uncommon that manufacturers show field evaluation during wintertime or when the temperature is low. However, it is more difficult to find accurate data results at high temperatures (>25ºC), typically found in summertime or tropical areas, in which poorer performance of the sensor is expected.

Being aware of this and discarding the use of any Machine Learning due to its limitations, Kunak has been working on a new correction to get the most precise and accurate data in these environmental conditions. Kunak has solved all the challenges encountered in LCS, increasing the accuracy of the data, and reducing the error with respect to the reference instruments, without using any external data, or any other postprocessing model based on Machine Learning or AI. Thus, it is possible to monitor data accuracy near-reference, which allows the use of the LCS to complement the measurements of regulatory instruments, at higher spatial and temporal resolution.

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