

## ***Interactive comment on “Evaluation of a low-cost optical particle counter (Alphasense OPC-N2) for ambient air monitoring” by Leigh R. Crilley et al.***

### **Anonymous Referee #1**

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This paper presents an evaluation of a low-cost sensor (OPC-N2) for monitoring ambient particulate matter. Three inter comparison field campaigns have allowed for determination of precision, comparison with reference instruments and suitability for long-term monitoring. This study gives new insights on the ability of these low-cost instruments to measure ambient particulate matter and notably, the identification and correction of bias related to high relative humidity conditions. The manuscript is clear, well-written and is suitable for publication after considering minor changes.

Figure 3 shows that calculated average coefficients of variance (CV) (line 17 page 9) are influenced by a few high values and are below 0.1 most of the time. This effect of a few high values on average CV should be considered in the discussion. Would it be possible to quantify the bias due to relative humidity?

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Determination of K value: please detail the calculation of K and its uncertainties. Humidograms on Figure 8 show that fitted models may possibly be not suitable. When fitted curves are used for prediction or for quantification, quality and suitability of fitted models need to be examined through an analysis of residues. Here I expect that the model is not suitable (overestimation at low RH and conversely). In this case this would support the assumption page 19 of the necessity to use two models for low and high relative humidities - that would improve the correction independently of aerosol composition.

Many figures are small and difficult to read and assess (1 ; 5 ; 6 ; 7 ; 9 ; S2 ; S4 ; S5). In particular for readability Figure 1 could be reduced to the second period (21st to 24th of September) and Figures 5 and S5 need to be re-scaled since most concentrations are flattened by a few very high values.

Tables 1, 2 and 3: are they results of linear regressions (slopes) or ratios? In the first case indicate if intercepts are strained to zero or are non-significant.

The statement lines 16-17 page 20 (while two of the OPC-N2 had a similar distribution to the GRIMM (OPC13 and 14), the other two OPC-N2 appeared to show evidence for instrument drift as the mode has shifted relative to the GRIMM) is not obvious from Figure 9.

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