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Atmospheric Measurement Techniques Discussions

Interactive comment on "XCO2 estimates from the OCO-2 measurements using a neural network approach" *by* Leslie David et al.

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Again, we realy do appreciate the reviewer involvement in the evaluation of our work.

Unfortunately, we have not been able to reproduce the reviewer results concerning the XCO2 correlation (between true and ANN retrieval) when using only observation geometry data. We do find, however, a similar RMS (1.8 ppm). This RMS is for a single year of observation. When using 3 years of observations, as done in the paper, it is even larger (2.64) which is not surprising as the XCO2 growth rate impacts the data variability while there is absolutely no information in the input data to infer the year of observation (and thus the year to year variability of XCO2).

Conversely, when the spectra are provided as input to the ANN, we get a RMS of 0.7

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ppm (for the 3 year period).

Attached is a figure that shows the latitude-temporal evolution of the SZA, Asimuth and XCO2. Clearly, the SZA and Azimuth patters are reproduced from year to year, while XCO2 shows a significant change. Also, not that there is no longitude information in SZA and Azimuth (ie their values vary as a function of latitude and time in the year, but nothing else, contrarily to XCO2)

This is a clear demonstration, we feel, that the bulk of information is in the spectra rather than in the observation geometry

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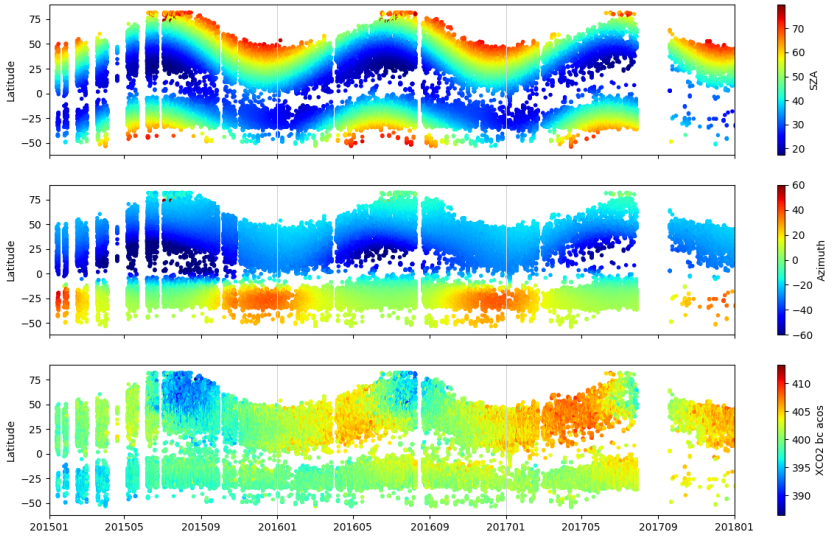

Fig. 1.

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