

## Reviewer # 1

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### Comments and suggestions:

1. Title: I think “in China” can be deleted. I think this system can measure HONO and NO<sub>2</sub> simultaneously in other country as well as China.

### Response

Thank you for your suggestion, we deleted “in China” in the title.

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### Comments and suggestions:

2. Page 2, lines 3-4 “such as O<sub>3</sub>”: O<sub>3</sub> is one of photochemical smog, so that other secondary pollutants are recommended (e.g. HNO<sub>3</sub>).

### Response

Yes, we agree and we have made change as suggested. We added “has been found worldwide to play a key role in enhancing the formation of photochemical smog and other secondary pollutants such as O<sub>3</sub>, HNO<sub>3</sub> and secondary organic aerosols in polluted atmospheric boundary layers Please see P2. Line 4.

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### Comments and suggestions:

3. Page 8, lines 4-5 “a slope of 0.988 and an intercept of 0.50 ppb,”: The authors should add errors of a slope and an intercept.

### Response

Thank you for your suggestion. It was corrected to: “a slope of  $0.988 \pm 0.0027$  and an intercept of  $0.503 \pm 0.0064$  ppb.” Please see P8 Line 6 - 7.

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**Comments and suggestions:**

4. Section 3.3.1: For HONO generation, do the authors confirm simultaneous generation of NO<sub>2</sub>?

**Response**

For HONO generation, no [NO<sub>2</sub>] was observed by this IBBCEAS.

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**Comments and suggestions:**

5. Section 3.3.1: The authors should state relative humidity (RH) as an experimental condition, and should discuss an RH dependence of the HONO loss.

**Response**

We have made change as suggested. We added “In this experimental cycle, the relative humidity(RH) was about 65 % and temperature was about 23 °C, the sample loss of the IBBCEAS instrument for HONO was found to be about 2.0 % (from average 46.0 ppb to average 45.1 ppb), as shown in Fig. 5(b). We also repeated this experiment at different RH levels, and found that the sample loss of the IBBCEAS instrument for HONO was about 2.1 % at 25 % RH and about 1.9 % at 50 % RH, suggesting a weak RH dependence of the sample loss of the IBBCEAS instrument for HONO.”

Please see P8. Line 29 – P9. Line 1.

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**Comments and suggestions:**

6. Section 3.3.1: NO<sub>2</sub> loss is negligible? The authors should comment the NO<sub>2</sub> loss as well as the HONO loss.

**Response**

Yes, NO<sub>2</sub> loss is negligible. We added “Furthermore, we also studied the sample loss of the IBBCEAS instrument for NO<sub>2</sub> as the similar approach and found that it was negligible.” Please see P9. Line 1 - 2.

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**Comments and suggestions:**

7. Section 3.3.2: The authors should discuss an RH dependence of the secondary HONO formation.

**Response**

We have made change as suggested. We added “To investigate any potential secondary HONO formation on the inlet or cavity walls from NO<sub>2</sub>, about 80 ppb NO<sub>2</sub> at different RH levels (about 20% RH, 30% RH, 50% RH and 70% RH) was flown through a 3-m PFA inlet tube into the IBBCEAS instrument for a long time at typical sampling flow rates, respectively, no [HONO] was observed in the optical cavity”. Please see P9. Line 10 - 11.

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**Comments and suggestions:**

Page 11, line 4 “a slope of 0.94 and an intercept of 0.10 ppb,”: The authors should add errors of a slope and an intercept.

**Response**

Thank you for your suggestion. It was corrected to: “The regression of LOPAP [HONO] against the IBBCEAS [HONO] yields a slope of  $0.941 \pm 0.0069$  with an offset of  $0.110 \pm 0.0089$  ppb.” Please see P11 Line 12-13.

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**Comments and suggestions:**

Page 11, lines 10-11 “The regression of BLC-NO<sub>x</sub> [NO<sub>2</sub>] against IBBCEAS [NO<sub>2</sub>] resulted in a slope of 0.964 with an offset of -0.123 ppb”: The authors should add errors of a slope and an intercept.

**Response**

Thank you for your suggestion. It was corrected to: “The regression of BLC-NO<sub>x</sub> [NO<sub>2</sub>] against

IBBCEAS [NO<sub>2</sub>] resulted in a slope of  $0.964 \pm 0.0042$  with an offset of  $-0.123 \pm 0.0539$  ppb.”

Please see P11 Line 20-21.

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**Comments and suggestions:**

Page 1, line 29: NO<sub>x</sub> → NO<sub>x</sub>

Page 1, line 30: R<sup>2</sup> → R<sup>2</sup>

Page 2, line 11: (Jr et al., 1984) → (Pitts et al., 1984)

Page 2, line 29: (J et al., 2001) → (Heland et al., 2001)

Page 4, line 11: f = 60 mm → f = 60 mm

Page 13, line 10: J, H., J, K., R. K., and P, W.: → Heland, J., Kleffmann, J., Kurtenbach,  
R., and Wiesen, P.:

Page 13, line 15: Jr, J. N. P., → Pitts, J. N., Jr.,

Page 15, line 30: NO<sub>2</sub> → NO<sub>2</sub>

**Response**

Corrected.

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