

## ***Interactive comment on “Exploring the potential of the RPA system SUMO for multi-purpose boundary layer missions during the BLLAST campaign” by Joachim Reuder et al.***

**Joachim Reuder et al.**

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First of all we would like to thank both reviewers for their review and very positive and constructive feedback. In the following the reviewers comments have been listed together with our response.

Reviewer 1

Line 60: Should be University of Colorado not University of Boulder. changed

Line 332: Should this sentence refer to longwave radiometer instead of net radiometer since the remainder of the sentence refers to LWout?

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This has now been formulated clearer: “The BLLAST campaign offered the possibility to test the potential of an airborne low-cost IR sensor for surface temperature estimates against other well established measurement methods like pyrgeometers or 4-component net radiometers. In using the output of the radiometers, the upwelling longwave radiation has been converted. . . .”

Reviewer 2

Line 60: This should say “University of Colorado – Boulder (CU)”. Note that the correct abbreviation is CU, not UC (don’t ask me why...)

Changed, see also reviewer 1

Line 147: Can you provide some additional information on the IR sensor? What is the technology? How big is it?

Corresponding information has been added and the paragraph in the manuscript reads now as: A downward looking infrared (IR) sensor, MLX90614 produced by Melexis, mounted in one of the wings, can be used to give an estimate of the surface temperature. The sensor consists of a thermopile detector chip sensitive for infrared radiation and a signal processing unit integrated in a TO-39 housing, i.e. a small metal cylinder with 8.2 mm diameter and 4.1 mm length.

Line 184: Recommend replacing “has been” with “was”.

changed

At some points, there may be a bit too much detail. For example, while the paragraph from lines 199-209 is very interesting, I think that the authors should consider whether all of these details are necessary here (I recommend reading through the manuscript one more time to assess whether the level of detail is appropriate, keeping in mind that the readership is likely looking for information on sensors and measurements, and perhaps are less interested in the fine details of operations).

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We have considered the comment on the high level of detail in the paragraph of the flight operations and the coordination between RPAS and manned aircraft operations. As the BLLAST campaign was the first coordinated operation of both measuring platforms for atmospheric research, we feel that it is appropriate and important to keep the paragraph as it is.

Lines 245-246: Has there been any consideration for performing corrections similar to those applied for radiosondes (e.g. Miloshevich et al., 2004).

We are aware of the corrections proposed by Miloshevich and others for radiosonde data. The Miloshevich method requires extensive laboratory characterizations of the sensors to perform the corrections. Having both data from ascent and descent within a very short time interval (typically 10 minutes) and at the exact same position from our SUMO flights, we are confident that we can perform an appropriate correction by the methods used and described and without relying on the laboratory data.

Line 266: how were the turbulence legs oriented to the prevailing wind? This was highly variable throughout the 49 turbulence flights performed and cannot be answered in general here.

Line 408: Pre-processing? Or post-processing?

We decided to call it just “processing”, as both expressions would fit, “pre-processing” with respect to that we have to do it before calculating the turbulence parameters, “post-processing” in the context as it is done not on-board the aircraft, but after the flight.

In addition to the reviewers comments have two references in the manuscript, Båserud et al., 2016 and Cuxart et al., 2016 been updated corresponding to the actual status of the manuscripts.

Please also note the supplement to this comment:

<http://www.atmos-meas-tech-discuss.net/amt-2015-397/amt-2015-397-AC1-supplement.pdf>

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Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2015-397, 2016.

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