

EDITORIAL

*Reviews and responses for*

**A First Look at Leveraging the Automatic Dependent Surveillance-Contract Protocol for Open Aviation Research**

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**Reviewers:** Emy Arts, David Lovell

**Editor:** Junzi Sun

**1. Original paper**

DOI for the original paper: <https://doi.org/10.59490/joas.2023.7229>

**2. Review - round 1**

**2.1 Reviewer 1**

**Readability / Layout**

Positive:

- The language used in the paper is clear
- The paper is well structured
- The use of figures, especially in the explanation of protocols and background, aids the readability

Negative:

- This work is missing a table of acronyms (and would greatly benefit from the usage of an acronym latex package). Some acronyms are not introduced at all (e.g. FANS).
- The usage of italic and bold are inconsistent and is at times confusing (this is especially true in section 2.3)

Minor items: l. 140 parenthesis, l. 140 Table 1 is mentioned several pages away from the actual table, l. 431 reference, figure, table, and section references not uniform (inconsistent use of "?? and "??")

**Content**

Positive:

- The introduction and background are described in detail
- The use of practical use ADS-C receivers is critically discussed

Negative:

- The location of the satellite dish is not mentioned, however, this is of great interest when describing and depicting coverage (it is likely shown in Figure 12 however this is not stated)

- Figure 11 compares coverage of the OpenSky network at a single point in time against the ADS-C over a 4-month period. This does not give the reader a clear picture. For comparison similar timeframes should be used. Figure 12 shows a sample of flights to provide a comparison of the coverage of these flights that could be compared to those same flights in the current OpenSky data.

Overall I believe this work should be published in the Journal of Open Aviation Science, under the condition that the location of the receiver is provided, this can be in the form of geographical coordinates or a description of the geographical region. Ideally, all the above-mentioned points shall be addressed as well.

## 2.2 Reviewer 2

This paper presents the background and structure of the ADS-C satellite-based messaging protocol, and describes how it might be integrated into the more crowdsourced ADS-B data ecosystem, particularly for research purposes. While the paper itself does not present any scientific novelty, it is useful to the community to understand this less accessible data source that can help fill major gaps in coverage, particularly in oceanic areas or continental areas not well covered with hobbyist ADS-B receivers.

A few minor notes:

\* Section 2.4.1, Contracts: "intereste" -> "interested"

\* Figure 6: it would be more realistic, and more in keeping with the surrounding text, if JAERO was shown as multiple parallel instances, with arrows fanning out from SDRReceiver to JAERO. Then, those instances could be reconsolidated graphically via the link to the MQTT messaging client.

\* Section 5.3: "almost a perfect complement". It might be worthwhile toning down the editorializing here. It is clear from Figure 11 that the data sources are complementary to some extent. However, the figure doesn't say anything about data that are not captured, and one could misinterpret the authors' intent here to imply that between these two sources, one is getting complete coverage.

## 3. Response - round 1

Thank you very much for your feedback. We did a full editorial pass of the paper and addressed your all points, including changing the map in Figure 11 to display a larger time frame during the time that we did our ADS-C collection.

A few notes:

- We could not do Fig. 11 for the same time frame as Fig. 12 (Jul-Oct) since OpenSky's Impala shell currently covers data only into September 23 due to the known problems. We don't believe it makes a real difference as OpenSky's coverage is fairly stable and any month of data reflects the ADS-B data coverage currently really accurately.

- We added some discussion that the position of the receiver is not relevant scientifically as any position that sees the satellite is sufficient and will produce the same results (this can be anywhere on the continent). Contrary to ADS-C, there's also no physical layer data related to the aircraft to be learned as all messages are simply relayed by the satellite. We are also reconsidering the exact integration of ADS-C into OpenSky

- this might better be a future paper when it is actually done. We will update the data we collect regularly on Zenodo, but currently, we're still experimenting with the setup.