

## Authors' response to RC1 comments

The authors would like to express their sincere gratitude for the interest shown in the submitted manuscript. The following section provides a detailed discussion of the comments raised.

### Major comments

1)

- **RC1:** *"Which monthes are "summer season" refers to?"*
- **AC:** Summer season refers to the months from June to August.
- **Change made:** Line 240: Added the parenthesis *"(from June to August)"*

2)

- **RC1:** *"Line 235: Please compare the influence of  $U(Z)$  and air-sea temperature difference."*
- **AC:** This target is out of the scope of the purpose of this data description paper. The idea of this work is to present air-sea heat fluxes data derived from observational measurements and to reflect the potential and the applicability of these data. In this section 4, the annual cycles of all three products are presented, and an explanation of their behaviour is shown linked with the disparities of the difference of temperature between air and sea, or the wind climatology. A comparison between these two factors would comprise a whole unique work of disentanglement of each forcing and attribution to each source, which is not the goal of this paper.

3)

- **RC2:** *"Are the thresholds selected for "Validation and QC" GT and ST applicable to the study area of this paper?"*
- **AC:** These GT and ST thresholds are considered applicable not only to the study area of the paper but also to the data sampling frequency. Abrupt changes exceeding those thresholds would be highly unreliable considering that the data sampling period is at most one minute, and usually even less, which are sufficiently high frequencies to not accept more abrupt changes than the ones reflected with those thresholds.

### Minor comments

1)

- **RC1:** *"Introduction: This work also provides air-sea flux data: Zhang, et al. MASCS 1.0: synchronous atmospheric and oceanic data from a cross-shaped moored array in the northern South China Sea during 2014–2015. Earth System Science Data, 2024, 16(12): 5665-5679."*
- **AC:** The paper recommended is an interesting example of an observation-based study of air-sea interaction and it has been considered as part of the bibliography references.
- **Changes made:** Line 26: *"studied on offshore platforms, buoys, and vessels in the open ocean since the latest decades of the 20th century (Smith, 1980; Large and Pond, 1981, 1982; Grachev and Fairall, 1997; Edson et al., 2013;."* changed to *"studied on offshores platforms, buoys, and vessels in the open ocean since the latest decades of the 20th century*

(Smith, 1980; Large and Pond, 1981, 1982; Grachev and Fairall, 1997; Edson et al., 2013; Zhang et al., 2024)".

2)

- **RC1:** "Line 14: "process" should be "processes"?"
- **AC:** Authors agree.
- **Changes made:** Line 15 and 17, "process" changed to "processes".

3)

- **RC1:** "Table 5-7: For the "-" in cells without values, the reason should be noted and the format should be uniform."
- **AC:** Dashes mean no values available due to lack of measurements. Specified in the caption of Table 5, 6, and 7.

4)

- **RC1:** "Stefan-Boltzman" should be "Stefan-Boltzmann"?
- **AC:** Authors agree
- **Changes made:** Lines 116, 308 and 369: "Stefan-Boltzman" changed to "Stefan-Boltzmann".

5)

- **RC1:** "Page 16: "emmissivity" should be "emissivity"?"
- **AC:** Authors agree
- **Changes made:** Line 308, "emmissivity" changed to "emissivity".

6)

- **RC1:** "Line 200: "makes" should be "make"?"
- **AC:** Authors agree
- **Changes made:** Line 203, "makes" changed for "make".

7)

- **RC1:** "All punctuation marks in the text should be uniformly formatted in English."
- **AC:** All punctuation marks have been uniformly formatted in English