

## Response to Editor:

Both reviewers raised important points regarding clarity, the handling of uncertainties, and the need to strengthen the coastal-city framing of the study. The authors have addressed these comments thoroughly. The introduction has been substantially improved, with clear articulation of the specific challenges for coastal megacities and better linkage between Guangzhou's characteristics, sea-land-breeze dynamics, and the study's objectives. Other improvements in the methodologies, findings and conclusions are also deemed appropriate. Overall, the authors have responded to the reviewers' concerns to a satisfactory extent, and that the manuscript now meets the standards of Atmospheric Chemistry and Physics in terms of scientific quality, methodological robustness, and clarity of presentation.

We therefore recommend acceptance for publication in ACP after minor editorial polishing. In particular, please ensure that: The abstract should convey the "coastal CO<sub>2</sub> dome" concept more plainly for readers; the relevant concepts are not immediately apparent from merely reading the abstract. Figure and table numbering, caption formatting, and units are double-checked for full consistency with journal style. Also, please ensure that the abstract and concluding section follow the strict guidelines now provided by ACP: [https://www.atmospheric-chemistry-and-physics.net/policies/guidelines\\_for\\_authors.html](https://www.atmospheric-chemistry-and-physics.net/policies/guidelines_for_authors.html)

### Response:

We sincerely thank the Editor for the thorough assessment of our manuscript and for the positive recommendation for publication pending minor editorial polishing. In response to the Editor's requests, we have revised the manuscript accordingly and summarize the changes below in a point-by-point manner. All changes are clearly visible in the tracked-changes manuscript.

In particular, please ensure that: The abstract should convey the "coastal CO<sub>2</sub> dome" concept more plainly for readers; the relevant concepts are not immediately apparent from merely reading the abstract.

### Response:

Thank you for pointing this out. We agree that the previous Abstract did not define the "coastal CO<sub>2</sub> dome" concept sufficiently clearly for readers without consulting the main text. We therefore revised the Abstract to state the concept explicitly by (i) contrasting it with the commonly core-anchored "urban dome" framing and (ii) describing in plain terms that the coastal dome is seasonally displaced—i.e., peak concentrations can shift away from the urban core—due to the interplay of coastal ventilation and biogenic exchange (Lines 22–24).

Figure and table numbering, caption formatting, and units are double-checked for full consistency with journal style.

Response:

Thank you for this reminder. We have carefully re-checked figure and table numbering, caption formatting, and units against the ACP style guidelines and corrected the remaining inconsistencies.

For figure numbering and panel labels, we removed or revised uppercase panel identifiers (A)/(B) (e.g., Figs. 4, 5, and 11) and ensured consistent lowercase panel labeling where applicable. We also ensured that the first letter of each column header in the supplementary tables is capitalized.

For caption formatting, we clarified what each panel label represents when subpanels are used (e.g., explicitly defining **(a)–(c)** in Fig. 6 and **(a)–(d)** in Fig. 7). We further formatted all panel labels in **bold** to improve readability and maintain consistency. For terminology, we expanded terms at first mention in captions where helpful (e.g., “land cover product of China (CLCD)” in Fig. 1 and “two-dimensional (2D)” in Fig. 9) and used abbreviations thereafter when they have already been defined in the main text.

In addition, we performed a comprehensive check of units and symbols throughout the manuscript (including the Supplement) and corrected remaining issues (e.g., exponent formatting and spacing) to ensure full consistency with journal style. All changes are highlighted in the marked-up manuscript.

Also, please ensure that the abstract and concluding section follow the strict guidelines now provided by ACP: [https://www.atmospheric-chemistry-and-physics.net/policies/guidelines\\_for\\_authors.html](https://www.atmospheric-chemistry-and-physics.net/policies/guidelines_for_authors.html)

Response:

Thank you for drawing our attention to this. We have carefully re-checked the revised manuscript against the author guidelines of ACP and revised both the Abstract and the Concluding section to ensure full compliance.

**1) Abstract.** We revised the Abstract to align with ACP’s requirements in structure and style. We clarified the “coastal CO<sub>2</sub> dome” wording for broader accessibility, streamlined quantitative reporting by emphasizing the key summertime takeaway (CO<sub>2</sub>bio offsets ~ 60 % of concurrent CO<sub>2</sub>ff) rather than listing additional absolute CO<sub>2</sub>bio values/uncertainties, removed other secondary numerical details (e.g., site-specific amplitudes), and tightened redundant phrasing (e.g., “reported”, “quantified”). These edits improve concision and readability, ensure that the Abstract remains within the 250-word limit, and preserve the main quantitative results that support our conclusions.

**2) Conclusions.** We revised the Conclusions to align with ACP's expectations for a synthesis-focused concluding section. In particular, we reduced background-style restatement at the beginning, trimmed repeated numerical details that primarily duplicated the Results, and tightened sentence structure to avoid an overly long, result-by-result recap. The revised Conclusions now place greater emphasis on integrated interpretation of the physical mechanisms (including seasonally contrasting SLB impacts and biogenic modulation), provide clearer context with previous studies where appropriate, explicitly acknowledge limitations, and articulate broader implications for coastal-city monitoring, inversion design/interpretation, and mitigation-relevant assessment. All changes are visible in the tracked-changes manuscript.