# Response to RC

**Comment:**
Thank you for your detailed documentation and revision in response to the previous reviewer comments. I believe the revised manuscript is substantially strengthened via these revisions. I have one suggestion for a minor revision regarding Section 3.2: In my previous comments I asked about defining LLJs using the "common" Eq. 1 and this paper's Eq. 2. I appreciate that the authors calculated LLJs using both equations in this revision so that the frequency comparison with previous literature (presented in Table 3) is based on the common definition (Eq. 1). However, subsequent figures and discussion refer to LLJ frequency based on Eq. 2 (e.g., Figures 6 and 7 and discussion therein). I ask that Table 3 be expanded to also include LLJ frequency as determined from Eq. 2, and that the text be expanded slightly to remind readers why the subsequent analysis focuses on LLJs identified via Eq. 2. You did explain your reasoning in Section 2.2 but I think a short statement to remind readers would be helpful here.

**Response:**
We would like to thank the reviewer for their valuable comments, which have helped improve the manuscript. As suggested, Table 3 has been revised to include the LLJ frequency based on Eq. (2). The corresponding text has also been revised, and a brief explanation has been added to clarify why LLJs identified using Eq. (2) are used in the subsequent analysis.

**P.12, L234-246**
**Original:** "The seasonal variation of LLJ frequency was further examined (Table 3). For comparison with European studies, LLJs were detected using the definition described in Eq. (1). It should be noted that the occurrence rates presented here are calculated relative to the total number of days, rather than the total number of 10-min interval records. LLJs were observed more frequently in spring and summer. This seasonal tendency is consistent with results from European studies focusing on the North and Baltic Seas (Dörenkämper et al., 2015; Schulz-Stellenfleth et al., 2022; Svensson et al., 2016; Wagner et al., 2019).Wagner et al. (2019) reported daily LLJ occurrence rates of 74 %–81 % in spring and summer in the southern North Sea, whereas the present study indicates a lower daily occurrence rate of approximately 39 %. However, this comparison is based on a single observation site, and additional measurements across multiple locations in Japan are required to confirm the robustness of this finding."

**Revised: "**The seasonal variation of LLJ frequency was further examined (Table 3). Table 3 presents LLJ frequencies calculated using both Eq. (1) and Eq. (2). Since Eq. (2) uses a less restrictive criterion than Eq. (1), the occurrence rates derived from Eq. (2) are generally higher. It should be noted that the occurrence rates presented here are calculated relative to the total number of days, rather than the total number of 10-min interval records. LLJs were observed more frequently in spring and summer. This seasonal tendency is consistent with results from European studies focusing on the North and Baltic Seas (Dörenkämper et al., 2015; Schulz-Stellenfleth et al., 2022; Svensson et al., 2016; Wagner et al., 2019). For comparison with European studies, we used the LLJ frequencies calculated using Eq. (1), Wagner et al. (2019) reported daily LLJ occurrence rates of 74 %–81 % in spring and summer in the southern North Sea, whereas the present study indicates a lower daily occurrence rate of approximately 39 %. However, this comparison is based on a single observation site, and additional measurements across multiple locations in Japan are required to confirm the robustness of this finding. LLJs in the subsequent analysis are identified using Eq. (2). Under the criterion defined by Eq. (1), even when a low-level wind speed maximum is present, the profile is not classified as an LLJ unless a corresponding $u_{min}$ criterion is also satisfied. In the context of this study, such profiles are considered physically meaningful and are therefore included in the analysis using the relaxed criterion."