RC2: *It appears there are references missing in lines 75 through 79, or at least a note to reference the following paragraph where the references exist.*

We thank the reviewer for catching this. The general statement regarding ongoing performance evaluation methods (lines 75–77) was not directly tied to a citation; the references appearing shortly after (Schulz et al., 2016; Diendorfer, 2016; Schwalt et al., 2020) were only explicitly attached to the specific DE percentages quoted afterward. We will revise the text to attach a citation to the general claim itself, e.g.: “These ongoing changes are reflected in the network's performance, particularly in terms of detection efficiency (DE) and location accuracy (LA). Existing performance evaluations are based on a combination of direct lightning observations from instrumented towers and supplementary video and electric field measurements at selected sites (e.g., Schulz et al., 2016, Diendorfer, 2016).”

RC2: *Is there logic as to why the threshold for structure height was 150 m?*

Two reasons, which we will make explicit in the text in the revised manuscript (Sect. 2.2.1):

1. Comparability with prior work: Zhu et al. (2020) applied the same 150 m minimum height when selecting NLDN towers.
2. Physical/algorithmic justification: Zhu et al. (2020) additionally showed, via their Monte Carlo simulations (their Fig. 2d–2f), that below approximately 150 m the elevated lightning-density signature around a structure becomes difficult to distinguish from background lightning density — in their 150 m / 1 μs timing-error case, the density-enhancement algorithm failed to identify a valid cluster at all. This provides a quantitative lower bound below which the underlying assumption of our method (a detectable local density enhancement) becomes unreliable.

We will add a sentence to Sect. 2.2.1 citing both points explicitly, rather than stating the threshold without justification.

RC2: *Regarding the sentence in line 195, how many clusters are there total? Are event clusters comprised of strokes?*

The total number of retained clusters is 257 — one final cluster per retained structure (consistent with the 257 structures reported in Sect. 2.2.1, line 152). We will amend the sentence at line 194–195 to state this explicitly again, e.g.: *"...clusters containing more than 250 events still collectively account for 21% of the total (N = 257)."*

Regarding composition: each cluster is built from individual EUCLID-reported *discharges*, not flashes — and, per Sect. 2.1 (lines 118–120), this includes both CG strokes and IC pulses, since no CG/IC filtering is applied. We will check the text and correct any place where "strokes" was used loosely to mean "discharges/events" in general, to avoid this ambiguity in the manuscript.

RC2: *Some acronym definitions are repeated, please check for first appearance of acronyms appropriately.*

We thank the reviewer and will carry out a full pass through the manuscript.

RC2: *Is the EUCLID data filtered to only be reported CG strokes? Or are IC discharges included? What method is used to exclude ICs if ICs are excluded?*

No filtering is applied: both CG and IC discharges are included in the analysis, and no additional selection criteria (e.g., peak current thresholds) are used to exclude either type. This is stated in Sect. 2.1 (lines 118–120). Our rationale, also given there, is that large structures frequently produce upward lightning with mixed IC/CG signatures, and excluding IC pulses would discard a non-negligible — and structure-dependent — fraction of tower-attributed events, particularly for structures in mountainous regions or during winter, where upward flashes are more prevalent.

RC2: *For structures located on the edge of the sensor network, should there be a separate consideration due to the worse DE as represented by the larger median location accuracy in Figure 6? Additionally, it is odd that the latter years exhibit a worse median location accuracy for some structure locations (between 450m and 500m). Are these outliers towers that are on the edge of the network?*

- We thank the reviewer for this suggestion. To test it directly, we computed, for each of the 257 structures shown in Figure 6, the geodesic distance from the structure to the nearest edge of the EUCLID network boundary and examined whether median LA increases as structures approach this boundary. We do not find a statistically significant edge effect in our dataset (Spearman $\rho = -0.08$, $p = 0.19$, $N = 257$). However, we note that this “negative” result should be interpreted with caution: only a small number of our structures actually lie close to the network boundary (e.g., N = 4 within 100 km, N = 12 within 100–200 km), so our test has limited statistical power to detect an edge effect even if one is present. This is in contrast to, for example, Zhu et al. (2020), who used a much larger and denser set of towers along the periphery of the U.S. NLDN and were able to resolve a clear edge effect on location error in their, e.g., Figure 4b. We therefore cannot rule out that a similar effect exists in our network but is simply not detectable with our current, comparatively small and non-edge-concentrated sample of structures. We would propose to insert , right after "...mean and median LA obtained with the adopted methodology are 137 m and 124 m, respectively, with a 95th percentile of 258 m." and before "In the background of the Fig. 6, the underlying colour field represents..." following text to address this point “*We further examined whether structures located closer to the EUCLID network boundary (dashed line in Fig. 6) show systematically larger median LA, using the geodesic distance from each tower to this boundary. No significant relationship was found (Spearman's $\rho = -0.08$, $p = 0.19$, $n = 257$); however, only a small number of towers in our dataset lie close to the network periphery, which limits the statistical power to detect such an effect. Given that Zhu et al. (2020) identified a clear edge effect on location error using a substantially larger and denser set of towers along the boundary of the U.S. National Lightning Detection Network, a similar effect cannot be excluded for EUCLID and may become detectable as the number of instrumented structures near the network periphery increases in future studies.*”
- We examined the 4 outliers (out of 115 structures with median LA ≥ 300 m in 2023–2025) and found they had roughly twice as many lightning events available in 2012–2014 as in 2023–2025. Using the full 2012–2025 record, where these structures have much larger, more robust clusters, their median LA is similar to the 2012–2014 values and consistently lower than the 2023–2025 sub-period, supporting a short-window sampling fluctuation rather than genuine degradation. None of the four flagged structures are located near the network boundary.

RC2: *A few case studies using known structures, such as from video camera observations of lightning or documented structure information, may provide further validation to the method.*

We agree this is valuable, and note that the manuscript already includes two such case studies: the Gaisberg and Säntis instrumented towers (Sect. 3, Fig. 5a–b), for which independent ground-truth location-accuracy values exist in the literature (Schulz et al., 2016, updated to 2000–2022; Azadifar et al., 2015, for 2010–2013). Our DBSCAN-derived moving-median LA values are compared directly against these published, independently obtained estimates, and show strong agreement — this constitutes the structure-level validation the reviewer is requesting, sourced from previously published ground-truth campaigns.