

Answers to the Anonymous Referee #2

Answers are in italic blue text.

RC2: 'Comment on egusphere-2024-594', Anonymous Referee #2, 22 Apr 2024

1. I agree with the review posted by Reviewer #1. My only additional comment would be that Figure 2 and its related discussion would be aided with some ground truth observations of precipitation type within the shown domain. For example, all snow observation locations would be plotted in the "snow" column of subplots. These observations would ideally come from ASOS, LSR, or crowdsourced mPING reports. Without these observations, it is difficult to determine whether the simulations are improved with the SIP inclusion across the domain (and not just at the small domain of subsequent analyses).

Thank you for your comments.

We only have access to a few stations that reported hourly accumulated precipitation, most of them are not available. However, we will add the following figure (Fig. R1, which will become Fig. 3 in the revised manuscript) showing the observed and simulated number of hours for rain, snow, freezing rain, and ice pellets.

A sentence referring to this figure will be added to the main text (line 237):

“Finally, the total number of hours during which snow, rain, freezing rain, and ice pellets were simulated with the experiments that included the FFD process were similar to the observations included in the ISD (Fig. 3).” (ISD: Integrated Surface Database)

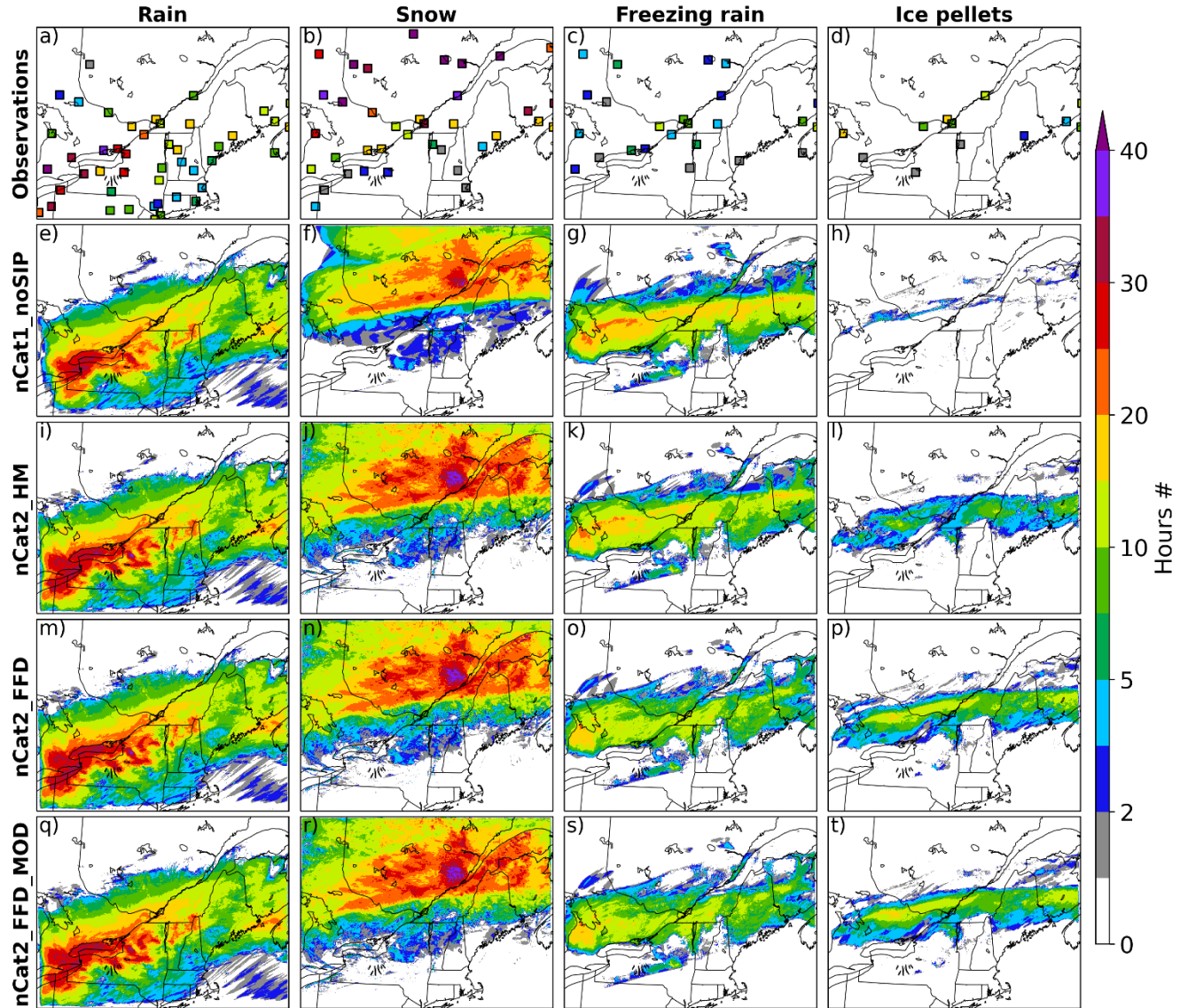


Fig. R1: New Figure 3. Total number of hours during which (a) rain, (b) snow, (c) freezing rain, and (d) ice pellets were reported at airports included in the ISD database between 00 UTC 10 January 2020 and 00 UTC 14 January 2020. (e-t) Total number of hours during which the simulated precipitation type was (e, i, m, q) rain, (f, j, n, r) snow, (g, k, o, s) freezing rain, and (h, l, p, t) ice pellets for (e-h) nCat1_noSIP, (i-l) nCat2_HM, (m-p) nCat2_FFD, and (q-t) nCat2_FFD_MOD. Only precipitation types with a rate $> 0.2 \text{ mm h}^{-1}$ were considered.