The authors present a detailed study of cloud property susceptibilities (of liquid water, albedo, and cloud fraction) to droplet numbers in low liquid marine clouds in the NE Atlantic, using new geostationary satellite data. They show diurnal variations in the susceptibilities, with the responses being most negative in the early afternoon – when the widely used Aqua satellite collects data. This could point at a bias in studies quantifying the susceptibilities from this time of day. The study is carefully argued, with the right level of detail, and gives important insights into the responses of clouds and climate to anthropogenic aerosol. But there are a number of major points to be addressed before publication.

Major comments:

1. Arola et al (2022) showed that even a positive Nd-LWP relationship can give negative correlations when regressing, due to natural variability and retrieval errors. Is this a pertinent potential source of error for your study? They restrict to small retrieval errors (working on MODIS data) and show that the relationships grow weaker. Please test the sensitivity of your results, especially Figure 3 on diurnal variability, to restricting more or less to retrieval uncertainty. Is there a way you can assess the importance of natural variability changing the retrieved slope?

2. On causality: The retrievals will show causation and covariation: position in the cloud (edge vs. inner part, time variations)? You argue, that we do not expect the meteorological parameters to vary much in the 1deg grid box, but then we expect the same for aerosol concentrations–can we still say that Nd variations are from aerosols alone? This is what is implied in calling the correlations/regression coefficients 'susceptibilities'. To what extent are we able to say that an (e.g. anthropogenic) increase in Nd would lead to a corresponding change in LWP, albedo, CF? Please add a discussion of this.

3. This becomes particularly important when looking at transitions or 'cloud memory': Does an observed stronger correlation of Nd and LWP in thin clouds which were previously thick mean, that if we now added aerosol, they would dry even more? Or is this more negative correlation because of the processes involved in the thinning of thick clouds? On page 13, regarding your hypothesis 3, you examine the decay of thin clouds, which does not explain the changes. But clouds undergoing a similar 'decay' from thick to thin are shown to have strong susceptibilities. In particular, in line 405, you say that "Similar results are obtained using classification methods based on [different CF thresholds (e.g., from 10% to 30%) or] changes in the mean LWP". To test hypothesis 2 (cloud memory), you use a two-hour LWP change classification. This means that the only difference for testing hypotheses 3&2 is the time scale (30 mins vs. 2h), but it is not immediately obvious why dissipation should not happen more slowly. In short: Could the cloud memory effect (thick-thin) just be dissipation of thick clouds, and the mechanism not cloud memory but covarying effective radii and LWP? To claim 'cloud memory', you need to rule this out.

Specific comments:

l. 308-310: "*Precipitation acts to stabilize the boundary layer, remove water from cloud top, and reduce the entrainment rate (Sandu et al., 2007, 2008). Precipitation suppression and entrainment weakening work in concert and result in a net increase in LWP with increasing Nd.*"
This does not make sense to me. If precipitation tends to reduce the entrainment rate, its suppression strengthens the entrainment rate. So both processes work against each other? Please, could you elaborate on this?

l. 334-336: *"The opposite signs in LWP and CF susceptibilities for non-precipitating thin clouds cannot be solely explained by the evaporation-entrainment feedback. In the next section, two additional hypotheses regarding the development/dissipation of clouds and the transition of cloud states will be tested."*
I agree that the opposite signs in LWP and CF adjustment cannot be explained with evaporation-entrainment. But I do not find an explanation later, after you introduce the hypotheses and conclude susceptibility variations are due to cloud memory. To me, this does not explain the opposing signs. Please include a discussion.

L 368: "*The diurnal variation of cloud susceptibility is statistically significant at a 95% confidence level based on a student's t-test.*" Please elaborate: What are the variables/means that are compared here, with what variability?

Figure 2: What is the variability (e.g. the standard error of the mean) in the averaged 1x1deg susceptibilities for each LWP-Nd bin? Can you state which average susceptibilities are significant? Why are some squares missing in some panels but not in others?

l. 616: *"The less stable condition over the studied region leads to a deeper boundary layer, deeper clouds, and a stronger entrainment rate at the cloud top, all of which may cause a more negative LWP susceptibility"*
To me, this raises the question how much can we extrapolate to all year liquid marine clouds from July data. If the susceptibility is a function of boundary layer depth (which it should be), then it will change with changing SSTs over the seasonal cycle. Please discuss.

Technical corrections:
L 40/41: The cloud adjustment effect, on the other hand, is highly variable
L 119: We then discuss (delete comma)
L 281 responses from both for
L 370 "valuers"
L 514 increases in the afternoon, and becomes (instead of become)

Reference
Arola, A., Lipponen, A., Kolmonen, P., Virtanen, T. H., Bellouin, N., Grosvenor, D. P., Gryspeerdt, E., Quaas, J., & Kokkola, H. (2022). Aerosol effects on clouds are concealed by natural cloud heterogeneity and satellite retrieval errors. *Nature Communications*, *13*(1), 7357. https://doi.org/10.1038/s41467-022-34948-5