

Review of manuscript egosphere-2024-1749 submitted to Natural Hazards and Earth System Sciences (NHESS)

Classification of North Atlantic and European extratropical cyclones using multiple measures of intensity

by Joonas Samuel Cornér et al.

General comments:

This manuscript presents a systematic classification of Extratropical cyclones (ECs) over the Euro-Atlantic region based on two types of intensity metrics: dynamical and impact-based. The authors highlight using of 5 metrics to assess the intensity of ECs and present a classification of 4 clusters consistent with previous studies. I consider the present manuscript well-written, the analysis well-performed, and the topic of interest to the community of NHESS. Therefore, the manuscript may be published. Minor issues have been found that need to be addressed before the manuscript can be published. My detailed comments are found below.

Specific comment:

I found it novel that this study considers both the dynamics and impacts of cyclones. However, weak cyclones are located in the Mediterranean area where we have seen several EC damages in recent years. You have mentioned that Medicane Apollo is one of the weak cyclones (line 553). How would you suggest using your framework in operational forecasting to determine tropical cyclone impacts? (as suggested in lines 690-692) Is it necessary to look at all 5 metrics? If so, what role do the 4 clusters play?

Technical corrections:

- I found the abbreviation for 850 hPa relative vorticity (“VO”) confusing. Why is not “RV850” used?
- For the case study, it might help to have a map with the cyclone tracks.
- The caption of Figure 2 needs more details.
- Line 16: What do you mean by “sensible weather”?
- Line 18: “Buildings” are also “infrastructure.”