Response to Reviewer #1

We thank the reviewer for their time and constructive comments. We have complied with most of the proposed changes. In the following, the comments made by the reviewer appear in black, while our replies are in blue.

The present manuscript provides a comprehensive overview of the intensification and convection formation of Medicane Ianos using different limited area models. While there are many articles related to Medicane Ianos, the reviewer recognizes that this manuscript represents a thorough investigation of the most important factors that could affect the formation and intensification of the medicane, including initial data, resolution, and initial time, with significant scientific collaboration.

The manuscript is very well written. Despite the complexity of the research, which involves numerous models and sensitivity experiments, the authors have managed to condense the information in the figures and text in a way that flows smoothly and is easy for readers to follow.

I believe the document should be published, with only a few minor comments that the authors should review or clarify. Otherwise, the document is excellent in its current state.

MINOR COMMENTS:

Line 190 (page 7): In the sentence ”Additional simulations were initialized at 00 UTC on 14 September but are not shown, because they generally did not develop a cyclone,” you use the word ”generally,” which does not imply ”all.” Does this mean that at least one model configuration developed a cyclone at 00 UTC on the 14th? If so, it would be good to be more specific, because if at least one model did develop a cyclone at that time, it would be worth describing here, as I don’t know any previous scientific paper that showed that in the past.

In the large majority of models the initial surface low does not intensify and sticks to the Libyan coast. Only two models (WRF-AUTH and MESONH-LAERO) produce a cyclone but weaker and with larger bias in track compared to the later initializations. It was clarified that simulations initialised at 00 UTC on 14 September either produce even larger shift in track and underestimation in intensity or do not develop a cyclone (not shown). We prefer not discussing the individual model behaviour in more details, as we seek a robust response among models and variants.

Line 200 (page 7): Is there any database with estimated intensity based on different types of observations?

Unfortunately, there is no reliable satellite-based estimate of intensity for medicanes yet—such a the Dvorak technique for tropical cyclones. This has been clarified in the text.

Lines 323 - 325 (page 11): Here, you might consider discussing that explicit convection with deep convection parametrization switched OFF may result in overly strong cyclones and excessive precipitation in some cases. Additionally, you could mention that the ocean-atmosphere interaction in the model could help mitigate this negative effect.

We added a discussion on the apparent overestimation of wind and precipitation intensity at high resolution that might be mitigated by a more realistic representation of the complex air-sea interactions and feedbacks in this case, with reference to the recent paper by Karagiorgos et al. (2024) on coupled ocean-wave-atmosphere simulations of Ianos (though at lower resolution).

Figure 4: The legends in the figure captions should be described more thoroughly. While they are clear when reading the article, they are not immediately clear just from the figure caption.

We added a legend and clarified where to look at for the IFS analyses (black curves and dots at 00 UTC), ERA5 reanalyses (dotted curves) and the station of Palliki (blue star) to make the figure caption self-explanatory.