Dear anonymous referee #1

thank you very much for your comments and suggestions. This discussion will definitely improve the quality of the paper. Regarding specific comments we will include all your corrections and suggestions in the final version of paper. However regarding your specific comments:

Page 2130, line 15: 'ME02-ME05' should be 'ME01-ME05'

We explicitly explain the ME01 case on page 2130, line 17; therefore we did not add ME01 with ME02-ME05. The ME01 case showed different behavior than ME02-ME05.

Page 2135, line 30: Reference 'Ruti, D. M.' if it is not published, the reference should not be used'

The citation introduce the Med-CORDEX initiative and our chosen Med-CORDEX domain, not the scientific issues. This paper is at present sent back to the journal after revision. Hopefully, it will be accepted before our final revision. If not we will not use this reference.

General comments:

Different resolutions and CCLM configurations

The referee is right, except the changes in atmospheric grid resolutions all other configurations of CCLM remain the same in all the atmosphere-only and coupled without spectral nudging simulations. It is also true for spectral nudging simulations. We will clarify this in our final manuscript on page 2023 line 6.

Why in some cases the track from CCP08 and CCLM08 simulations differ substantially from those obtained from the MERRA reanalysis?

We have started our simulations three weeks before the medicane development (page 223, line 18-19). Therefore, it is not possible to follow the real atmospheric conditions. The reason of starting simulations three weeks before the medicane formation is to have a couple of weeks ocean spin-up in coupled simulations. To be consistent with the coupled simulations we also used same period of simulations in the atmosphere-only simulations. This is the main reason why the medicane tracks in CPL08 and CCLM08 are significantly different from the MERRA reanalysis data. However, applying spectral nudging to CCLM increases the precision in time and location of the medicanes (page 2127, line 20-21). In this study we are not interested to address the precision in time and locations (page 2127, line 27). As the referee also mentioned, in this study our primary goal is "to investigate the impact of the air-sea interactions in the coupled model on the intensity of the medicanes as compared to the atmosphere only model and adequate atmospheric grid resolution essential to resolve medicanes features" (page 2121, line 8-11).
(We will add the following lines on page 2123 after line 19)
"The reason of starting simulations three weeks before the medicane formation is to have a couple of weeks ocean spin-up in coupled simulations. To be consistent with the coupled simulations we also used same period of simulations in the atmosphere-only

simulations."
(We will add the following lines on page 2126 after line 25)

"Also we have started our simulations three weeks before the medicane development. Therefore, it is not possible to follow the real atmospheric conditions. This is the main reason why the medicane tracks in CPL08 and CCLM08 are significantly different from the MERRA reanalysis data. However, applying spectral nudging to CCLM increases the precision in time and location of the medicanes".

How important are the differences in the surface fluxes and the latent heat release?

This suggestion is very interesting for us, so we propose to add the following paragraph with two figures of latent and sensible heat flux in simulations without spectral nudging to our article. This will explain the physical mechanisms involved in the development of medicanes:

(We will add following paragraph for "surface heat fluxes" in ME08 case on page 2127 after line 26 in our final manuscript.)

The surface heat fluxes (latent and sensible heat flux) play an important role in the formation and evolution of medicanes (Tous and Romero, 2011). Figure 1 and 2 shows the mean sea level pressure, latent heat flux and sensible heat flux, respectively, on 7 October 1996 at 18:00 UTC along with medicane track (black dots). The results show that the intensity of the latent and sensible heat fluxes increased with increasing atmospheric grid resolution. The coupled simulation CPL08 shows higher absolute values of latent and sensible heat fluxes together with a more intense medicane than the atmosphere-only simulation. Thus, the results suggest that intensity of medicanes is strongly linked with surface heat fluxes.

Similar to the simulations without spectral nudging the latent and sensible heat fluxes are higher in the coupled spectral nudging simulations (not shown). The spectral nudging simulations did not show any significant differences in the latent and sensible heat fluxes compared to the simulations without spectral nudging.

Higher values of latent and sensible heat fluxes are due to the high resolution of 1-D NEMO-MED12 ocean model that increase the changes in the meso-scale activities. In a study, Stanev et al. (2001) showed that the high-resolution models modify the SST due to increase in the changes in the meso-scale activities. They found that the ocean model with $1/12^{o}$ resolution showed an increase of 20% in the surface net heat loss with respect to $1/4^{o}$.

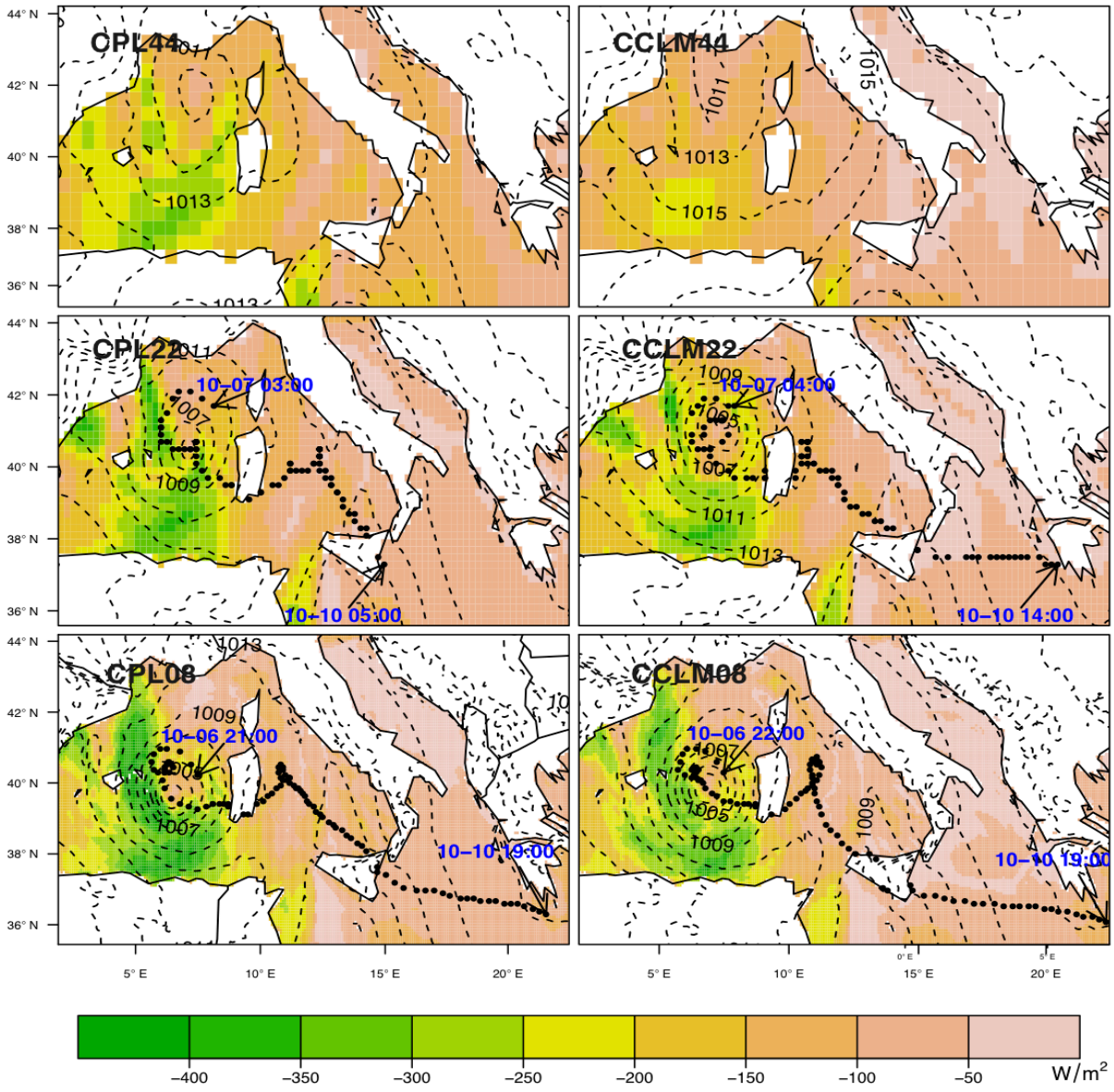

Fig. 1. ME08; mean sea level pressure (hPa; dotted contours lines at 2hPa intervals) and latent heat flux (w/m^2: colored contours at 50 w/m^2 intervals) in coupled and atmosphere-only (0.44^o, 0.22^o, and 0.08^o) simulations on 7 October 1996 at 18:00 UTC. Black dots represent track of the medicane.

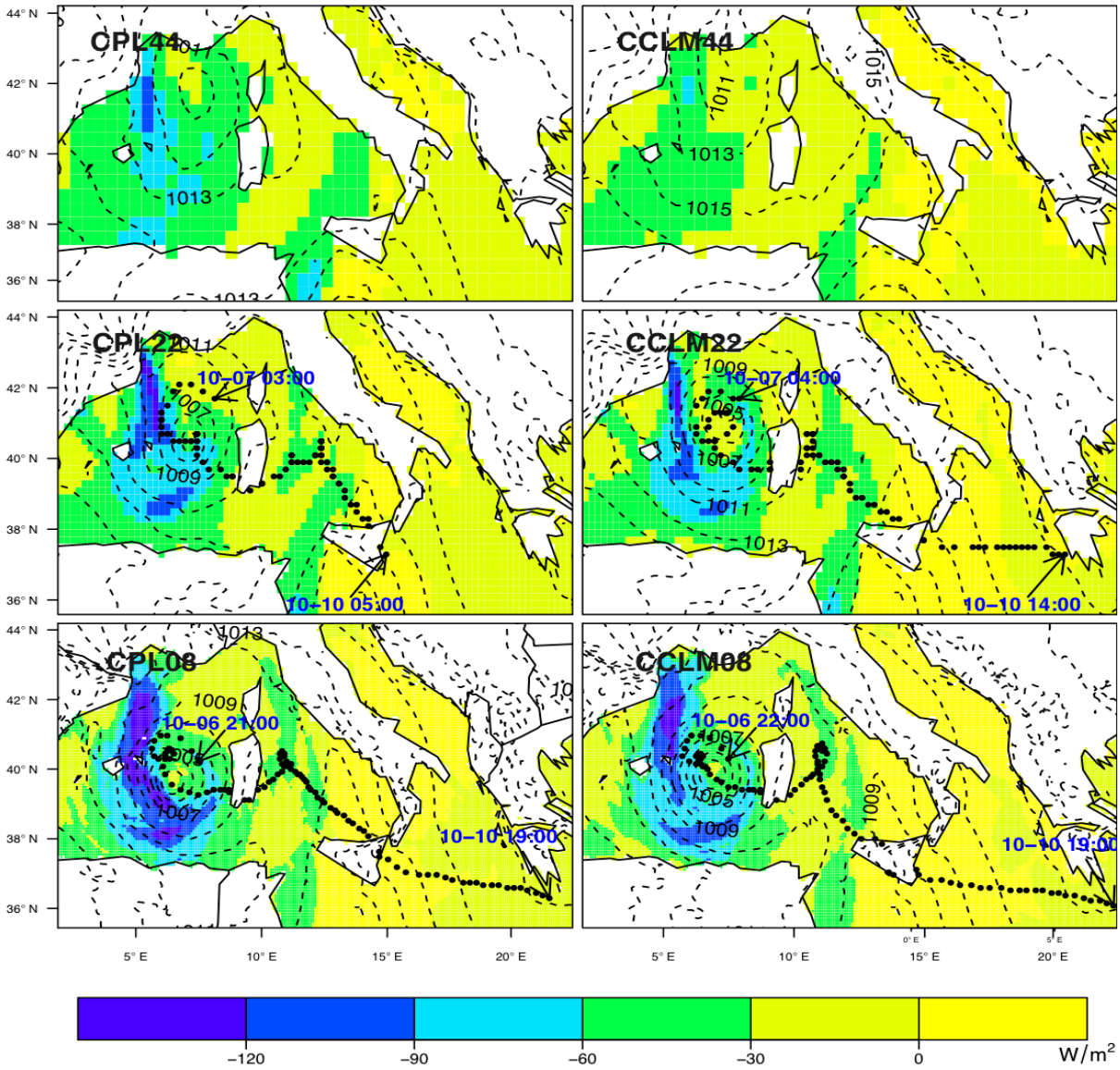

Fig. 2. ME08; mean sea level pressure (hPa; dotted contours lines at 2hPa intervals) and sensible heat flux (w/m²: colored contours at 30 w/m² intervals) in coupled and atmosphere-only (0.44º, 0.22º, and 0.08º) simulations on 7 October 1996 at 18:00 UTC. Black dots represent track of the medicane.

References

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