

I'm pleased to see that the authors have made a great effort to improve the manuscript in several aspects. The structure of the analysis is now more solid, objective and concise. The reader can now follow the entire narrative without getting lost with unnecessary, repetitive and confusing considerations and results. The manuscript finally follows a solid and robust storyline. The overall quality of the writing has also been improved, although there are still some minor issues that need to be worked on (please see my minor comments). I suggest the authors to do a thorough review of the text, as there are still several typos and many sections that need to be written more clearly.

My final comment goes for the last two chapters (Discussion and Summary). I suggest merging the two sections into one. Some results discussed in the "Summary" chapter are not even mentioned in the "Discussion" and vice-versa. The ideas and the reasoning are much better organised in the "Summary" than in the "Discussion" chapter. I suggest putting together the considerations made in the two chapters and to basically wrap up the analysis following the formula used in the "Summary", adding some other observations that were included in the Discussion. As you will see in my following comments, many parts of the "Discussion" are still unclear. I think the key message here is to simplify, to be more objective and to find a more effective way of sharing the main outcomes of the analysis and to pass the message for the reader.

Minor Comments:

Line 51: "Soil moisture is essential (...)"

Line 52: Please change accordingly: "According to Osso et al. (2002) Europe has **been experiencing** an increase (...)"

Line 61-62: I would remove the following sentence. It sounds a bit vague... "Regions exhibiting strong LA coupling coincide with those previously identified through various coupling metrics (...)"

Line 72-76: I suggest to break this text section into two smaller sentences. "The analysis conducted (...) in Europe since 1979 (Becker et al., 2022)".

Lines 119-124: This sentence is too long. Please try to split it into two.

Line 125: Change accordingly: On average, LH in ERA5 tends to be overestimated by about 9Wm⁻².

Line 126: These correlations were obtained in respect to which dataset? Also, a reference needs to be included here.

Line 128-129: Please change accordingly: in ~~various studies~~ **previous works**.

Line 134: There's an extra comma before the word "Additionally"

Line 141: Change accordingly: "The LCL deficit (m) is defined as **the** height difference (...)"

Line 153: Change accordingly: “(...) ~~describes~~ corresponds to the (...)”.

Lines 177-179: No need to describe so extensively what figure 1 shows. The figure caption already contains all this information.

Lines 181-182: Please rewrite this sentence: “Previously, there was a stronger interannual variability with mostly more than 50% of the grid cells with positive soil moisture anomalies”. It reads weird.

Lines 182-183: Change accordingly: “ Since 2015, positive temperature anomalies have been observed over more than 75% of the grid cells. Before 2015, only the years of 1994, 2003, 2006 and 2012 were characterized by having more than 50% of the grid cells covered by positive temperature anomalies.

Lines 186-187: “With the exception of 2016, the proportion of positive anomalies is more than 50%, while, as with the previous temperature, apart from 1994, 2003, 2006 and 2012, at least 50% of the grid cells show negative anomalies.”, Again, it reads weird.

Lines 188-189: Can you please clarify this? I’m not getting what you’re trying to say here...

Lines 191: Change accordingly. The evaporative demand of the atmosphere increases with higher temperatures resulting in a further reduction of soil moisture and an enhanced dewpoint depression. This relation pattern has been observed in the recent summer seasons, particularly after 2015.

Line 193: What do you exactly mean by “anomaly spread”? It is not clear.

Lines 214-216: I understand what you’re trying to say here, but this needs to be written in a clear way. Pls rewrite.

Line 217: Change accordingly: “(...) with medians showing a short variation over time (...)”.

Line 218-221: Again, I understand what you’re trying to say here, but the authors need to find another way to describe and explain these results.

Line 229: Remove: “(...) and, thus, to an agricultural drought”.

Line 230: Change accordingly: “(...) it was included in our analysis considering (...)”

Line 237: Change accordingly: “(...) During **the** summer **of** 2006, the 2m temperature ~~are~~ **were** highest north (...)”. Please keep the same verb tense while describing the results. This applies to the entire manuscript.

Figure 3 caption: Change accordingly: “(...) The top left panel shows the mean summer 2m temperatures computed for the period between 1991 and 2020.”

Line 248: Change accordingly: “**The year of** of 2006 (...)”. This applies to the entire manuscript.

Line 250: Change accordingly: “(...) associated with **a** warm temperatures and (...)”.

Lines 268-269: Rewrite the following sentence with an appropriate scientific description of the results. “The reason is the (...) of the summer”.

Line 359: Change accordingly: “(...) and thus a **stronger negative** LCL deficit (...)”

Line 370-371: I got lost here: “In summer 2006, 2015, and 2017 the ACILH-HLCL is positive over large parts of Central Europe indicating that LH variations drive the evolution of HLCL”. As you mentioned previously and correctly a potential physical relation between land surface and atmosphere only occurs when ACILH-HLCL is negative, right? Could you please clarify?

Lines 372-373: Please divide this sentence into two, as follows: “This implies that LH either has little variations or is high compared to other summer seasons. This leads to a HLCL decrease and, ultimately to a residual LCL deficit over Central Europe as shown in Figure 9.

Line 387-394: This text section sounds a bit out of context... It doesn't provide any useful information for the LH-CAPE coupling.

Lines 429-433: Please consider changing this text section to the following: (...) In agreement with Jach et al. (2022), the Southeast/East Europe and the Baltic states were found to be regions marked by a strong $ACI_{LH-CAPE}$ coupling. However, when analysing the interannual variability of $ACI_{LH-CAPE}$, a weak connection is observed between this coupling mechanisms and temperature and humidity conditions, suggesting that such variability might be driven by other atmospheric processes.

Lines 436-437: Change accordingly: “(...) despite higher temperature, strong LA coupling is largely limited to **South Europe** ~~European South~~ as seen in the summer of 2021 (...)”.

Lines 437-438: This reads weird: “This matches with the finding of Guo and Dirmeyer (2013), that areas with normally wet climate can experience a shift in coupling regimes under dry conditions”.

Lines 446-451: This section of the text needs to be rewritten. Authors should find a better way to link all the sentences creating a more objective and clear narrative. The ideas and the reasoning are disconnected. The English writing quality should also be improved.

Lines 451-454: Please remove the following text section. Your results show nothing for the future: “(...) The increased frequency (...) in 2021 for instance”.

Lines 455-461: Improve the English writing.

Lines 462-472: Following my comment above, this text section is very confusing. This needs to be explained in a clear way. Try to simplify your message and to create a solid and objective narrative.

Lines 481-482: “This led to a stronger westerly flow air which allows for more humid air masses from the Atlantic”. Again, try to keep the same verb tense. To correct this problem, the entire manuscript should be carefully proofread.

Lines 519-521: “In wet years, LH does not depend on the soil moisture availability as sufficient transpiration of the leaves is possible and the HLCL is not primarily controlled by the lack of

moisture at the surface". This is not correct. Under energy-limited conditions LH is controlled by the amount radiative energy. If you're referring to something different, please clarify. Be carefull... this sentence might lead to a wrong interpretation. Clarify.