The authors have developed a really nice new data for vapor pressure deficit across Europe from 1600-1994, which was spatially gridded.

The paper was clear and well-written, and should be published after some minor corrections and elaboration of some points. It was enjoyable to read this manuscript, and the authors have done a great job communicating their results.

We want to thank the reviewer for the appreciation/suggestions/comments/feedback that will help us improve our manuscript, and for taking the time to read and review our paper. We have reviewed all the comments and suggestions and provided a point-by-point response below. The reviewer's comments are shown in black and the replies are shown in red.

The authors do not discuss how changing δ18O of precipitation can influence their record. The correlations to VPD are robust, but could much of the unexplained variance be due to changes in precipitation δ18O? This could be tested by looking at high-resolution speleothem records of δ18O. Bunker Cave, Germany is one example (https://www.mdpi.com/2076-3263/11/4/166), and there should be others. Even over the modern interval, precipitation d18O from the IAEA data set may help place some of the tree-ring d18O records in context, and this would be a useful and welcome addition to the paper.

Thank you for your suggestion. We will carefully consider assessing the role of changes in precipitation d180 using the data suggested by the reviewer.

I would also like to learn more about the significance of VPD in general for agriculture, ecosystems, etc., in the Introduction. It would also help make the paper have higher impact. Elaboration of why this new data product can be useful will be a good addition to the revised manuscript. For example, testing between a temperature, precipitation, or combined response to produce the VPD would be interesting.

We will discuss more extensively the added value of our study in the introduction according to the reviewer suggestion.

L75: If leaf δ18O is a function of leaf-to-air VPD, how then does the δ18O signal get transferred to the tree rings? Lines 201-202 help show it is real, but how does it actually happen within the tree?

The link between δ18O and VPD was briefly described in the introduction: To a good approximation, tree ring-δ18O from European sites can be considered as a combined signal of the largely temperature-dependent δ18O of the water source (precipitation, soil water) and the evaporative 18O enrichment of leaf water controlled by leaf-to-air VPD, so that tree ring-δ18O can be used as a proxy for variations in VPD (Ferrio and Voltas, 2005; Kahmen et al., 2011). We will also add more explanation in the revised version of the manuscript.

L80, delete "for"

We will modify accordingly.

96: how do you test whether 26 series are enough to extract the signal?

Using reconstruction skills based on the CE metric (Fig. 4), we can determine where our statistical model can extract VPD signal from tree rings and where it cannot.

L272 and elsewhere: the reference to the solar irradiance events in L272 was abrupt, and not thoroughly contextualized in the rest of the manuscript. Provide some more context of why you are comparing the reconstructed VPD to irradiance, to give some idea of why you would expect there to be a relationship in the first place. If there were a reasonable correlation, showing the irradiance events on Figure 6 would be helpful. If there is not a clear correlation to TSI, then it would be better to not use TSI as a climate template against which to interpret the VPD record.

Thank you for this suggestion. We will remove these statements on solar irradiance.

L324: severity, not sensitivity

We will modify accordingly.

L336: there are many more types of paleoclimate data than just tree rings. It would be nice to avoid the silo effect by checking into the high-resolution speleothem or lake records of δ18O, because they would be a useful check on the changing δ18O of atmospheric precipitation. Relatedely, what range of δ18O variability is seen in the tree ring records? Including a representative example (or subset) would be useful. A few permil variability would be typical of many speleothem records (and likely in precipitation). How large are the variations in the tree rings?

The climate signals of the used network have already been studied and compared with climate signals from other climate proxies over long timescales (e.g., Balting et al., 2021). However, a comparison with the climate proxies listed by reviewer is difficult, as these have either not yet been associated with the complexity of the VPD variable or they have different temporal resolutions and a different seasonal/monthly signal which makes a statistical comparison difficult. Moreover, the study already bundles several complex research areas and further comparison with other proxies is beyond the scope of the study. In our study, the most important comparison remains between the isotopic network used and the climate observations, which we detail in Sections 3. Nevertheless, a more detailed comparison with other climate proxies is a very good idea for a potential fowling study. Nevertheless, in the revised version of the manuscript we will add a new figure with the mean δ18O for each site.