Comment on cp-2021-80
Anonymous Referee #1

Referee comment on "Climate change detection and attribution using observed and simulated tree-ring width" by Jörg Franke et al., Clim. Past Discuss., https://doi.org/10.5194/cp-2021-80-RC1, 2021

General comments

The paper addresses the relevant scientific questions related to the evaluation of model simulations and observed data, and within the scope of CP. Only one citation Hegerl and Zwiers, 2011 is not enough and even was discussed earlier in IPCC 2001 Detection of Climate Change and Attribution of Causes — IPCC. Reports TAR, Climate Change 2001, 2013 AR5 Climate Change: The Physical Science Basis Detection and Attribution of Climate Change: from Global to Regional.

Some parts of the methodological approaches are mixed up with results. The authors often avoid clarifications and explanations, which can be helpful. There is no clear conclusion, only assumptions. It is not clear how TRW chronologies were pre-selected, which method of standardization was applied. Moreover, all chronologies have different age trends, periods, site-specific, and species-specific differences. All uncertainties can be related to the methodological approaches and pre-selection procedure.

Specific comments

- L. 29 Starting from the first sentence - brings confusion between different forcing and factors. The main research question/hypothesis in the article can be better formulated. It is not clear if the main focus is irradiative forcing before /after volcanic eruptions or in general forcing or any other forcing factors or mechanisms that will be taken into consideration. It should be clearly formulated.
- L. 80 unclear which time period (past 600 years from xx to xx?). Which grid net was used (lat, alt)? TRW observations – common period? Which chronologies, citations, how many chronologies n=? Pre-selection high latitudes, mid-latitudes? Please provide citations and refer to Fig 1.
- L.89 no citation .” to prior studies”, which one? Please cite. ...” of reconstructed surface temperature”? Summer temperature? Annual temperature? Please specify.
- L.101 – historical temperature. Is it reconstructed temperature? If yes, please provide the period. If not, please clarify.
- Subsection 2.1 It will be good to provide more details about the TRW database used for analysis, e.g., time period, regions, species.
- Subsection 2.2 Please explain what T and M mean. “Parameters T1, T2, M1 and M2.
- L. 160 please clarify why a 71-year high-pass LOESS filter was applied.
- L. 194 this description should be provided earlier in Figure 1 legend
- L. 210-220 info about TRW chronologies, length, sites should appear earlier in section 2, subsection 2.1
- L. 262 it is unclear based on which criteria the 12 largest volcanic events were pre-selected (VEI?) and which one (names). Please clarify.
- Figure 5. It is unclear why annual temperature and annual precip. are considered? In legend VOLC – volcanic forcing, in Table 1 – V. Please select one abbreviation through the whole manuscript.

**Technical corrections**

- L.16 Abstract: tree ring width replace with tree-ring width
- L.42 – references are not in the correct order. Please correct.
- L.43 instrumental period of observations, please specify the period. For many stations outside Europe the instrumental period of observations for precipitation is rather short (ca. 50 years).
- Figure 1. Abbreviations should be clarified in the Figure legend. E.g., optimize S/N ratio. Please clarify numbers (B14)? Please check abbreviations and provided an explanation in scheme precipitation or precip.,) in the text L. 101 (PREC). Please be consistent.
- L. 105 – Eq. 1 is not in Section 2.4. Firstly, it was mentioned p.2. It should be Eq. 2. Please correct the numbers.
- L. 110 consider revision .. “is constructed is illustrated”
- Polson et al, (2013), replace with Polson et al. (2013),
- L. 176, 178 – please check (is/are)
- Fig 3, x-axis please write Year (CE)
- Fig. 3 in plot – edf and citation edf – please clarify
- L. 232 replace to ".a 11-year.."
- L. 341 AOD – please clarify.
- L. 342 please add a citation.