Reviewer comments on 2023-2643-ATC1

The authors have clearly taken my comments on board and made substantial revisions, and the focus of the paper – and the aim of the ClimaMeter methodology – is clearer as a result. I have a few additional comments below, mainly relating to the new text.

51. Replace ‘at the basis of’ with ‘which forms the basis of’

59. ‘a visual overview’

67. ‘and Storm Poly’

86. Suggest ‘Operationally we use data from MSWX’ to make the distinction clearer

99. Typo – ‘Finally, while’

134-5. It’s not clear whether analogues within a window of events that last for more than one day are also excluded. Why are one-day events treated differently?

164. Punctuation: ClimaMeter (please also do a case-sensitive search to check for other instances of this)

191. I think the definition of Q is still a little unclear. Is Q the mean of the EDs or does each analogue have 15 Q values, one for each analogue? Suggest ‘If … Q_obs (the mean ED from the actual event to the analogues) is below the 75^{th} percentile…’, and replacing Q with Q_obs where necessary.

210. Remove ‘creating the corresponding difference maps’ – I don’t think maps of the bootstraps are produced, only the statndard deviations are used to identify significant differences.

213. Typo: ‘is highlighted’

219. I think the addition of the ‘statistics of events’ here breaks up the flow of the description of the methodology, which would otherwise move smoothly from description of the analysis to the communication protocol. Suggest moving this to just before the conclusions, where it would fit better.

220. This explanation is not very clear. Suggest ‘Figure 2a presents the median value of the gauge values over all 41 events studied by ClimaMeter to date; Figure 2b shows the proportion of events found to be influenced by each of the modes of natural climate variability considered’.
Actually, I don’t think this is a very clear way of displaying this information: both subfigures are bar plots, but one represents the median gauge value (and should therefore only be able to take values between 5 and 95%) while the other represents the proportion of events affected. Using a bar chart for the proportions, which can take any value between 0 and 100 and where the shaded area is meaningful, is fine. However, Figure 2a is potentially misleading: a better approach would be to use histograms showing the distribution of the gauge values. A more compact alternative would be to plot a bar from 5-95% for each column, then to shade the appropriate segment according to the number of occurrences; in which case, to avoid confusion over the meaning of the two plots, it might be better to show Figure 2a using horizontal bars, rather than vertical.

228-9. This isn’t strictly accurate: Figure 2a doesn’t show the full distribution, so it’s not clear whether most studies have only 50% contribution from climate change, or whether half have 5%

contribution and the other half 95%. Furthermore, the ClimaMeter method doesn't actually evaluate the contribution from ACC directly, it only excludes the influence of other modes of variability: it would therefore be better to say something along the lines of 'the median percentage value suggests that differences between the analogues in the current and past periods can often be at least partially explained by modes of natural variability, rather than by climate change alone'.

231. It's worth mentioning that the finding that the climate change signal is most visible in heat extremes is in line with the IPCC's findings – see Figure SPM.3 (https://www.ipcc.ch/report/ar6/wg1/figures/summary-for-policymakers/figure-spm-3)

236. I don't see how this demonstrates the capabilities of ClimaMeter, although it's useful to have an overview of the results of past analyses – suggest removing the first part of the sentence and moving this paragraph to the end of the section.

375. 'the content is consistent with…'

413. Suggest 'than usual for the time of year' for clarity

420. 'weather situations' seems like an odd phrase here – maybe 'large-scale pressure events' or something similar?

423. Typo: 'the pressure over Britanny has become higher, while it has become lower over Italy'.

440. The conclusions here need to be updated.

485. Add reference to Figure A4

488. Given the uniqueness of the event, is it accurate to talk about 'storms similar to Poly'? What are the events that are identified as analogues?

492. Typo: Fig 8)

496-8. Typos: 'when comparing **the** gauge plots. Indeed, we **find** evidence that for the MSWX analogues the event **is** unique'

499. Could the selection of different analogues be due to choosing too small a domain size? Would it be better to consider a larger domain in order to find more consistent analogues? It would also be useful to know if differences in analogues are more common for certain types of weather events – this could be cited as potential future work if there's not enough information to judge at the moment.

504. Typo: '**and** the C3s…'

507. You should recap in the conclusions that, as mentioned in lines 99-100, there are limits to where analogues can be used effectively; this would also be a good place to acknowledge that the results may be sensitive to the choice of dataset and domain used.

520-1. I don't think this is necessarily a limitation of considering only the satellite era: this could also lead to overestimation of the effect of climate change since preindustrial times due to changes in the rate of local warming, but since the effect of climate change isn't actually estimated in ClimaMeter reports, that's not a major problem. I'd comment instead that the method risks underestimating the contribution of climate change by reducing the assumed influence of climate

change by 33% each time a significant difference is detected in a mode of natural variability, when actually both factors may contribute to the observed change in intensity.

532. Given the comment in lines 527-529 about ClimaMeter's role as an initial evaluation of the event, I think it's important not to oversell the potential use of the method in its rapid-attribution form in the next line. Suggest changing to 'Researchers can utilize ClimaMeter's methodology to…'

534. What kind of events not addressed in the literature?

538. Typo: 'to investigate the role…'

539-541. Again, the role of other attribution services should be acknowledged: confidence in any attribution result is increased if different methods produce similar or consistent conclusions. Suggest 'Policymakers can rely on ClimaMeter as an additional source of evidence as to how and to what extent specific extreme event categories in a given geographical area have changed over time thus enhancing the overall knowledge basis…' (since the changes are not, strictly speaking, attributed to climate change by this method).

541-544. This would follow on well from the end of the previous paragraph highlighting the benefit of ClimaMeter (and, I think, currently its main function) as a rapid communication tool, so I'd move this up to the start of this paragraph, and perhaps highlight again the speed with which reports can be produced.

561. (Perhaps more of an operational point) – it's important to distinguish between low confidence due to uniqueness of the event and low confidence due to inconsistency with previous results: for example, a very unique heatwave we would still be confident that climate change played a part, but under this framework the headline would be 'low confidence', which could be misleading.

Figures A1-A6. The observed values of ENSO, AMO and PDO are still missing.

697. Bibliography entry for Guardian article is wrongly formatted.