We would like to thank reviewer 2 for their positive and constructive review of our manuscript. We respond to each comment raised by the reviewer in the text below.

It might be worth mentioning in the abstract why solar irradiance is being investigated. It is covered well in the introduction, but the abstract jumps straight in.
Response: Thank you for this comment. We will add some text to the abstract on why we look at solar.

The SAM minima at 1400 CE does have a striking resemblance to the big decrease in solar irradiance (Fig. 1) at a similar time. I would be interested to see if it is this feature that is largely driving the correlation?
Response: This is a great suggestion. We explore the correlation between the model simulated SAM index and its corresponding radiative forcings using two approaches. Firstly, we use a bootstrapping approach to randomly reorder the Mk3L simulated SAM ($N = 10000$) to further assess the robustness of the correlation between the annual radiative forcing and annual SAM reconstruction. From this, we find that the OGS-Shapiro ensemble mean SAM index is significantly correlated with its higher-amplitude radiative forcing ($p < 0.05$, relative to a random distribution of the model data). Similarly, the OGS-x2 SAM index is significantly correlated with its radiative forcing ($p < 0.05$, relative to a random distribution of the model data). However, we find that OGS SAM is not significantly correlated with its radiative forcing any more than could be explained by a random distribution of the model data. Secondly, to specifically explore how much the correlation is driven by the 15th Century SAM minima and decrease in radiative forcing (from the decrease in the Shapiro et al., 2011, solar irradiance), we also remove the 1400–1500 portion of our time series and recalculate the correlation statistics between the OGS, OGS-x2, and OGS-Shapiro SAM indices and their corresponding radiative forcing. We find that the OGS-Shapiro ensemble mean and corresponding radiative forcing are still significantly correlated ($R = 0.58$, $p < 0.05$), while there is a smaller significant correlation for the OGS-x2 ensemble mean ($R = 0.42$, $p < 0.05$). The OGS ensemble mean is still not significantly correlated with its radiative forcing ($R = 0.17$, $p > 0.05$) with the 1400–1500 portion of the timeseries removed. If we remove a larger window, i.e., remove 1300–1600, we find only a slight decrease in the OGS-Shapiro and corresponding forcing ($R = 0.47$, $p < 0.05$) and a slightly improved correlation with OGS-x2 ($R = 0.53$, $p < 0.05$), though there is still no significant correlation with OGS and its radiative forcing ($R = 0.24$, $p > 0.05$). As we still find a significant correlation between the OGS-Shapiro ensemble mean SAM and its radiative forcing when we remove the 15th Century, or even a larger window, suggesting to us that the radiative forcing used is somewhat, but not entirely, driving the correlation for the OGS-Shapiro SAM index.

Is it worth briefly mentioning the statistical tests used in the methods?
Response: Thanks for this suggestion. We will add a sentence to briefly mention the tests in the methods.

I would be interested if you looked into any (centennial scale) periodic aspect of solar variability. There are a number of studies (in Patagonia and the South Atlantic) that claim to determine some periodicity in westerly wind behaviour, and some ascribe this to a possible solar forcing. Is there any reason to expect a periodic component of solar variability on a longer timescale than the well-known 11yr cycle?
Response: An analysis of any significant periodicities in SAM variability in the reconstruction or simulation data is an interesting area for future exploration, but beyond the scope of this study.