

## Response to Short Comment #1

We would like to thank Dr. Luening for his Interactive Comment, and respond to his suggestion below in blue.

On behalf of the authors,  
Henning Åkesson

While studying this manuscript I could not find any hint towards the Medieval Climate Anomaly (MCA). This is a phase which was anomalously warm in the study region and which was generally associated with a major glacier melt episode. Why is the MCA not featured in the article? The most likely driver of the MCA warming is high solar activity during this phase, requiring an adequate radiative forcing to produce an effect in the theoretical models. I strongly recommend to include a discussion on the MCA in the paper. Reference to the Little Ice Age requires an analysis of the preceding climatic event, i.e. the MCA, otherwise the discussion is incomplete.

We thank Dr. Leuning for raising this concern. The Medieval Climate Anomaly (sometimes referred to as the Medieval Warm Period (MWP) in the literature) is indeed an important climatic period in the recent past which, as Dr. Leuning points out, is associated with glacier retreat.

Nevertheless, there is little information to validate Hardangerjøkulen's response to a climate/mass balance forcing during this period. The same reasoning applies to the earlier Holocene, as mentioned in our response to the two reviewers. We do not intend to add mass balance variations/variability without constraints, and we also wish to keep our mass balance forcing simple in order to isolate the effects of bed topography and the SMB-elevation feedback. We also do not consider assessment of the responsible climatic forcing(s) behind the Little Ice Age, its preceding or following climates as a central aim of our study. We therefore do not think discussing the MCA/MWP is relevant for our purposes.