We want to thank the Referee for his comments and suggestions. Following his and the second Referees' comments we decided to change the detrending method of the tree-ring dataset. The climate reconstruction was accordingly revised and we found an improvement in the June-July temperature reconstruction with respect to the previous one. Hereafter are reported the answers to some of the main points arisen from the review of the manuscript. After the online discussion closure we will upload a full response to all reviewers' comments.

Referee's comments are light-blue shaded

Term "Little Ice Age" in the title refers to a very broad and relatively loosely defined time period, I suggest more concrete definition of the time period (since your reconstruction covers a period between 1600 and 2010 (roughly) you can change this in the title of the paper.

Following your suggestion and considering the improved version of the reconstruction obtained thank to yours and second Referee's comments we propose as a new title of the manuscript:

"Tree-ring based June–July mean temperature variations in the Adamello-Presanella Group (Italian Central Alps) for the period 1610-2008".

I really miss a good description of all four chronologies + combined chronology. How well do they synchronize (tBP and Gleichlaufigkeit), how much common variance is explained on the first principal component. Add this as a table and comment in a text.

Statistical description of the four raw site chronologies and of RCS chronology will be added as tables and commented in the text. We report hereafter the two new tables.

Site	Val Presanella	Val di Fumo	Val d'Avio	Val Presena
Code	PRL	FUM	AVI	PRS
Lat/Long	46°25'/10.65'	46°05'/10°34'	46°10'/10°28'	46°23'/10°60'
Elevation (m a.s.l.)	1910	1990	2150	2160
First year of chronology	1550	1710	1550	1645
Last year of chronology	2005	2008	2008	2004
Chronology length (year)	456	299	459	360
Number of trees	16	13	11	11
Mean length of series	257	215	348	179
Mean ring width (mm)	1,16	1,27	0,78	0,99
Mean sensitivity	0.22	0.26	0.24	0.28
Serial correlation	0.84	0.60	0.80	0.63

Table 1 Description and statistics of the four raw site chronologies of *Larix decidua.*

	FUM	PRS	PRL	
PRS	71.9			%GLK
	***			GLKsig
	12.35			tBP
PRL	70.8	67.5		%GLK
	***	***		GLKsig
	13.10	11.16		tBP
AVI	73.3	73.5	67.5	%GLK
	***	***	***	GLKsig
	13.6	13.44	12.41	tBP

Table 2 Correlation matrix of the four raw mean site chronologies showing Gleichläufigkeit (GLK, year-to-year agreement between interval trends, Schweingruber, 1988), the statistical significance level for the Gleichläufigkeit value and Baillie Pilcher t-values.

One thing regarding double detrending is also important – double detrending tends to produce very “flat” curves with very little or no low frequency. Low frequency is important if you want to detect real variability of changes in climate in the past and define warmer and cooler periods.

Considering yours and second Referee’s comments we decided to apply another detrending method to our raw growth series. In the revised version of the ms. in order to preserve as best as possible low-frequency information, we applied the regional curve standardization method (RCS, Briffa et al. 1992, Esper et al., 2003). All measurement series were aligned according to their cambial age smoothing the regional curve with a cubic spline of 10% the series length (Büntgen et al., 2006). A biweight robust mean was then applied to all the series (Cook and Kairiukstis 1990). Totally 51 series were used in the analysis covering a time period of 459 years, spanning from 1550 to 2008. Signal strength of the composite RCS chronology was assessed by means of the interseries correlation (RBAR) and the “expressed population signal” (EPS; Wigley et al. 1984). We assumed the 0.85 EPS value as threshold limit, limiting our reconstruction to the time period 1610-2008, corresponding to a minimum number series of 8. Hereafter the figure representing the development of EPS and RBAR over time as requested by the second Referee that will be inserted in the manuscript.

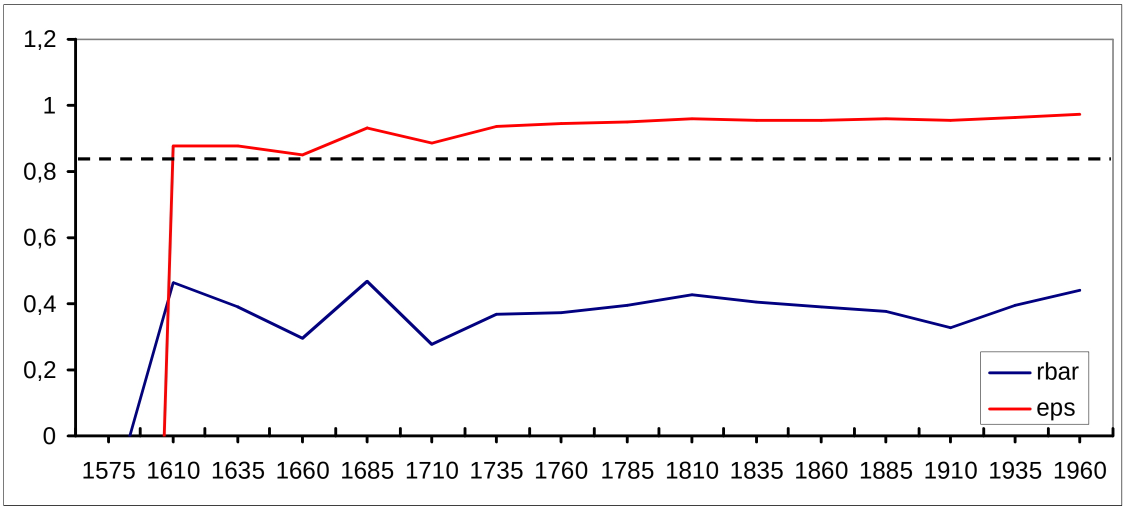

Figure caption. EPS and RBAR statistics showing the temporal signal strength of the RCS chronology. The horizontal line indicates the 0.85 EPS validity threshold. Mean RBAR value= 0.39.

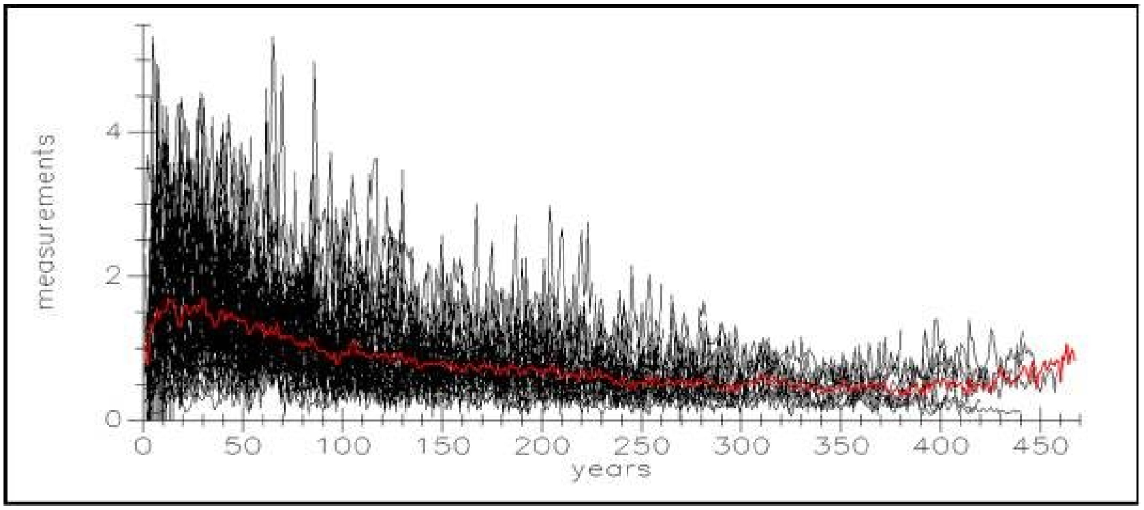

Figure caption: RCS aligned data with mean

First year	Last year	Total years	Mean index	Std. dev.	Mean sens	Serial corr
1	467	467	0.75	0.33	0. 10	0.97

Table 3: mean age-aligned chronology statistics

Despite the fact that your climatological time series is very long and justification that Jacoby also didn't take into account period after 1960, I do think that taking into account whole period would give you some much needed temperature variability in you reconstruction.

In the new version we decided to extend the calibration period to the largest overlapping period available between the high-elevation June-July temperature series and the RCS chronology (1818-2007). We checked the stability of the regression equation choosing a calibration/verification period of 188 years (1818-2006) and dividing it into two sub-periods of 90 years for the split-sample procedure, (1818-1912 and 1913-2006).
Moreover, in the improved version of our June-July temperature reconstruction, we decided to use the HISTALP low-elevation time series to verify our reconstruction in the period 1760-1818. The resulting reconstruction is shown in the figure below (Fig 7) that will substitute the figure 7 in the former manuscript and will be discussed in the revised manuscript.
We think that this new reconstruction has a better performance in tracking low frequency climate variability. Pearson's correlation between reconstructed and instrumental *high-elevation* June-July temperature series is 0.54 over the time period 1818-2008, and 0.62 between reconstructed and instrumental *low-elevation* June-July temperature series over the time period 1760-1818. Pearson's correlations values calculated between reconstructed and the high/low elevation instrumental series smoothed by means of a 10-yrs moving average increase respectively to 0.64 and 0.71 over the same periods, as above defined. The reconstruction shows a better tracking of recent early-summer temperature even if an underestimation is still noticeable. In the revised manuscript this reconstruction will be discussed in detail.

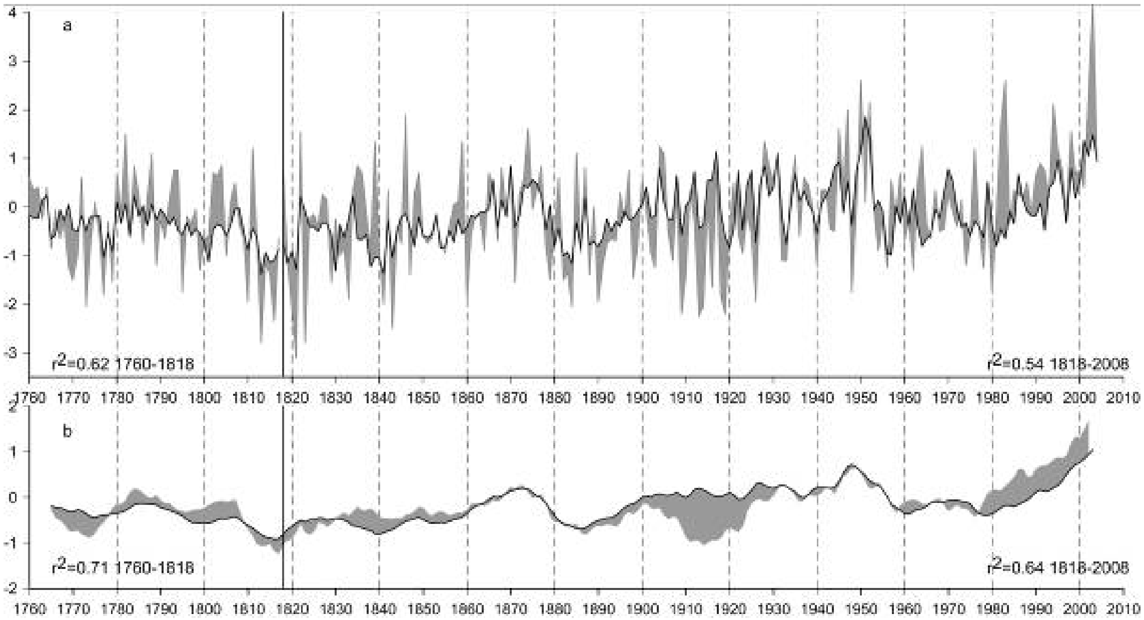

Figure 7 (a) Comparison of the reconstructed JJ temperatures (black) against the high-elevation JJ mean temperatures (grey) over their common period (1818–2008). Extra verification using low-elevation data back to 1760 is visible in the earlier part of the graph. (b): 10-year moving average of the reconstruction (black) and JJ mean temperatures at high and low elevations (grey). The offset between instrumental and reconstructed data is shaded.

Fonts in figures are too small, please increase them.

Fonts in all the revised figures will be increase.