Solar Influence on Civilizations: Preliminary, unverified results (...trash, rushed, partial, uncommented)

Appendix: Graphs and illustrations - extremely preliminary "ask questions" phase before hypothesis formulation

This file is an attachment for the main document. This is necessary because StarOffice can't handle modestly complex document structures in a pragmatic way.

Lots of stupid and irreverant comments in here at this stage.

Perhaps the temperatures are mostly influenced by GLOBAL irradiance variations (and leveraging such as galactic rays-clouds, water vapour-cloud, ice albedo, ocean absorbance etc), whereas crops are also affected in a big way by the pattern of seasonal variations (irradiance, precipetation, cloud etc etc)

Dates should be converted from "BC,AD, CE (Common Era, which is still pegged to the birth of Christ) to a more politically correct basis that is not biased or racist. For that we propose starting the dating from roughly the end of the early-Holocene decline in insolation+irradiance arbitrarily set at 9,000 BC or 11,000 before present. This we designate by the more neutral term for all religions, cultures, and political philosophies "Before Gods Were Invented" (BGI). That probably isn't true, but politically correct thinking is never true, nor safe, nor inoffensive anyways, so the proposed acronym is well adapted to current standards. Another acronym would be "BSE" for "Before the Stupid Era" which means long before current thinking styles in science (particularly environment , health and politics) became dominant. On second thought, it is perhaps a better description of the author's own zany thinking.

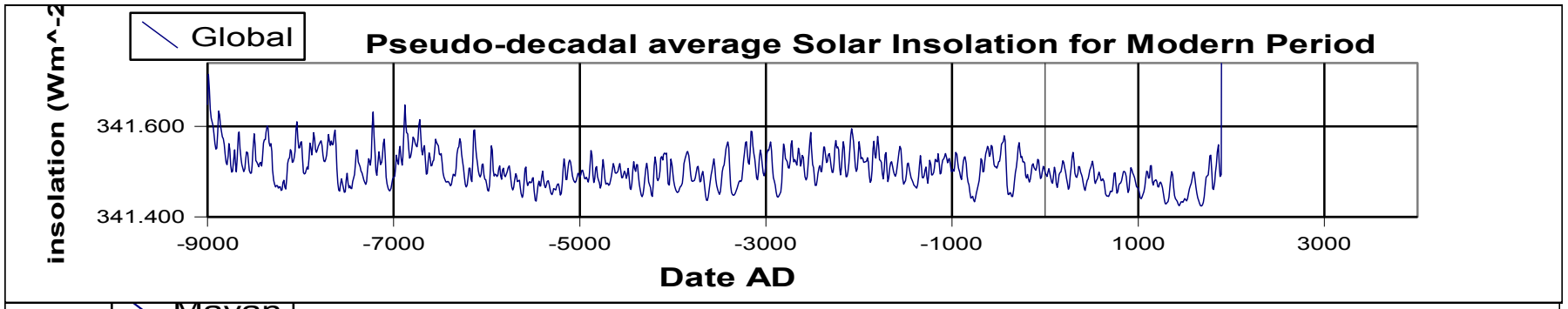
Based on Laskar et al, and Solanki, Tapping
Laskar solar insolation results assume 1368 Wm^-2
Not included yet!! - Sunspot data from 1890 to 2005 on the same basis as Solanki's data
Not included yet!! - Irradiance scenarios into the future bsaed on Charbonneu's chaotic model (infinitely many scenarios)
Not included yet!! - verification/ correction of irradiance from sunspots model based on Tapping etal
Howell's QNial program has a less accurate interpolation routine than Laskar etal (Howell's not used yet)

Note that all curves at present are based on the Maya "epicenter" selected for this work (i.e. latitude dependent).
An attempt has been made to keep the same physical/horizontal scaling to make for valid visual intercomparisons,, but of course longer-term graphs violate that.

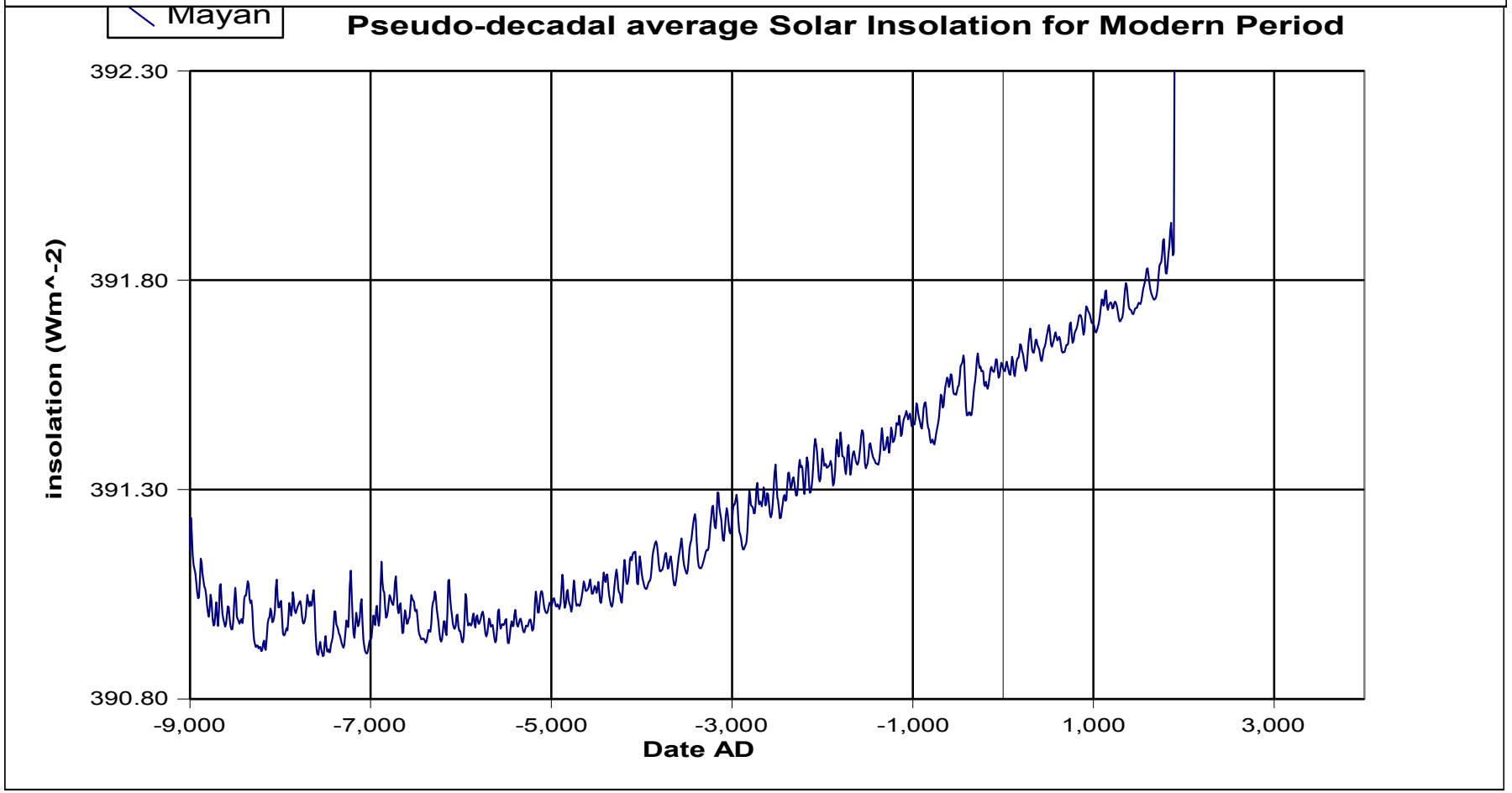
Themes to develop into hypothesis

Altitude AND Latitude
Moderating effect of upwind ocean proximity
Effect of mountain ranges, coastal etc.
Combine with Toynbee's perspective
The Brain - a HUGE influence on civilisation!!
- temperature and humidity

This page is "reserved" for future spillover of explanations, elaborations and bullshitting...


Global
Pseudo-decadal average Solar Insolation for Modern Period
insolation (Wm^-2
341.600
341.400
-9000
-7000
-5000
-3000
-1000
1000
3000
Date AD

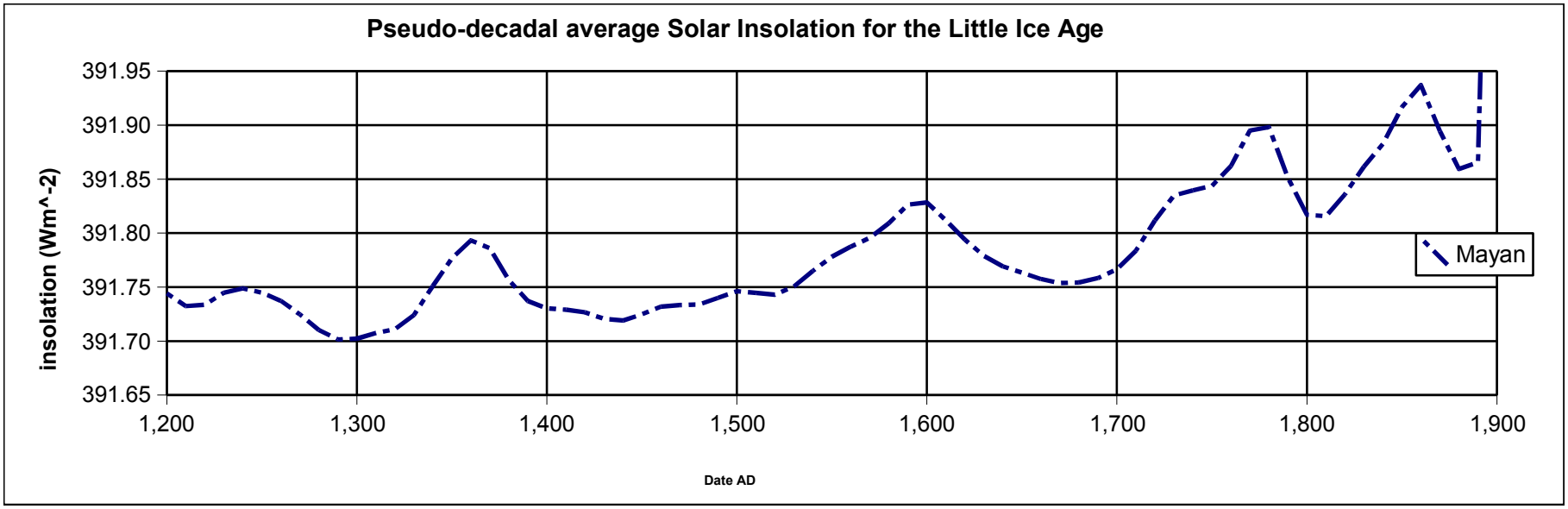
end


Mayan
Pseudo-decadal average Solar Insolation for Modern Period
insolation (Wm^-2)
392.30
391.80
391.30
390.80
-9,000
-7,000
-5,000
-3,000
-1,000
1,000
3,000
Date AD

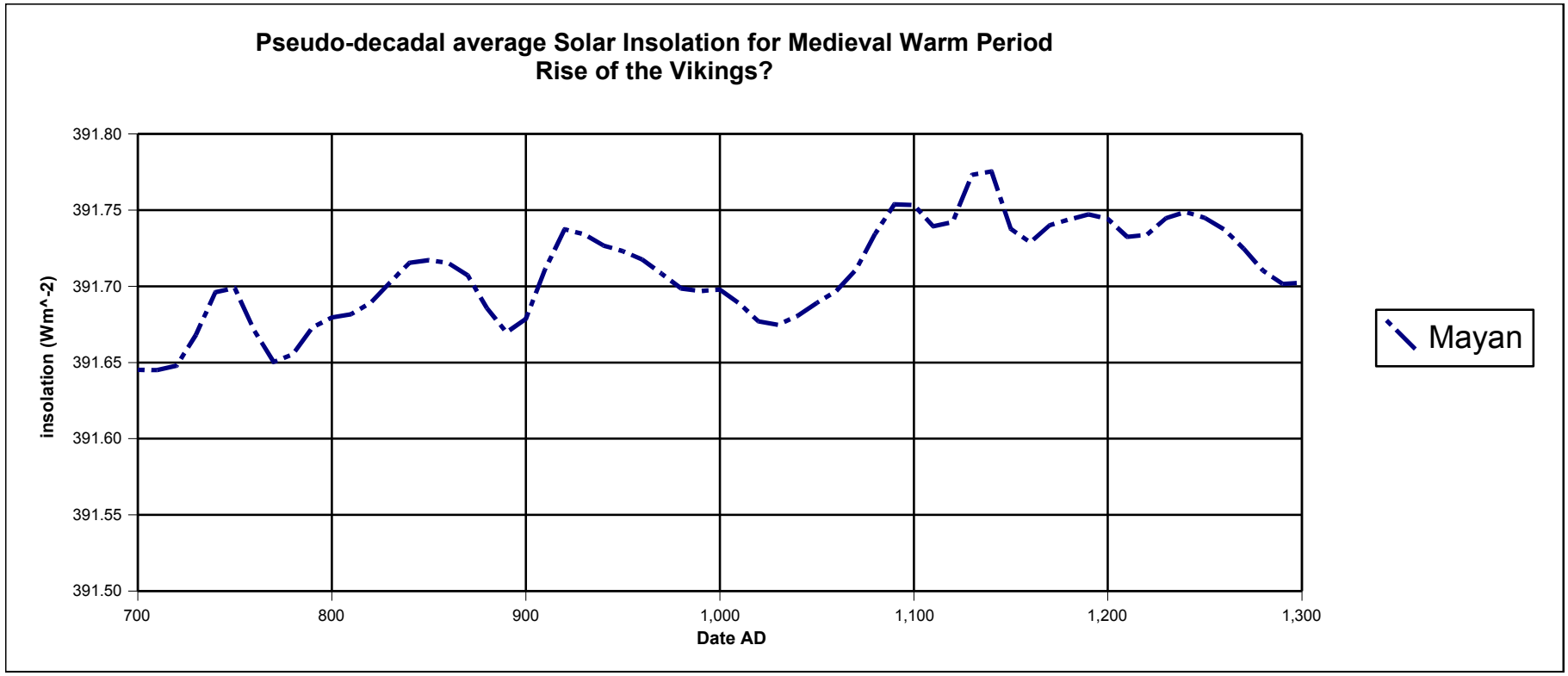
The graphs above cover most of the Holocene period (the period following the latest glaciation, up to the present time). Notice that the scale oif the Mayan average insolation has been "expanded" to give variability comparable with the variability of the global avberage insolation+irradiance.

Is the apparently linear rise in insolation from -5,000 on real, or a mistake in data treatment, or an artifact of the model? I don't know, but for now I'll work with it (it is produced by Laskar etal' computer program).

However, this rise may explain a "butterfly effect" (reverso of the sun from the equator to the poles) of a rolling hegemony with rising latitudes/ altitudes and time.

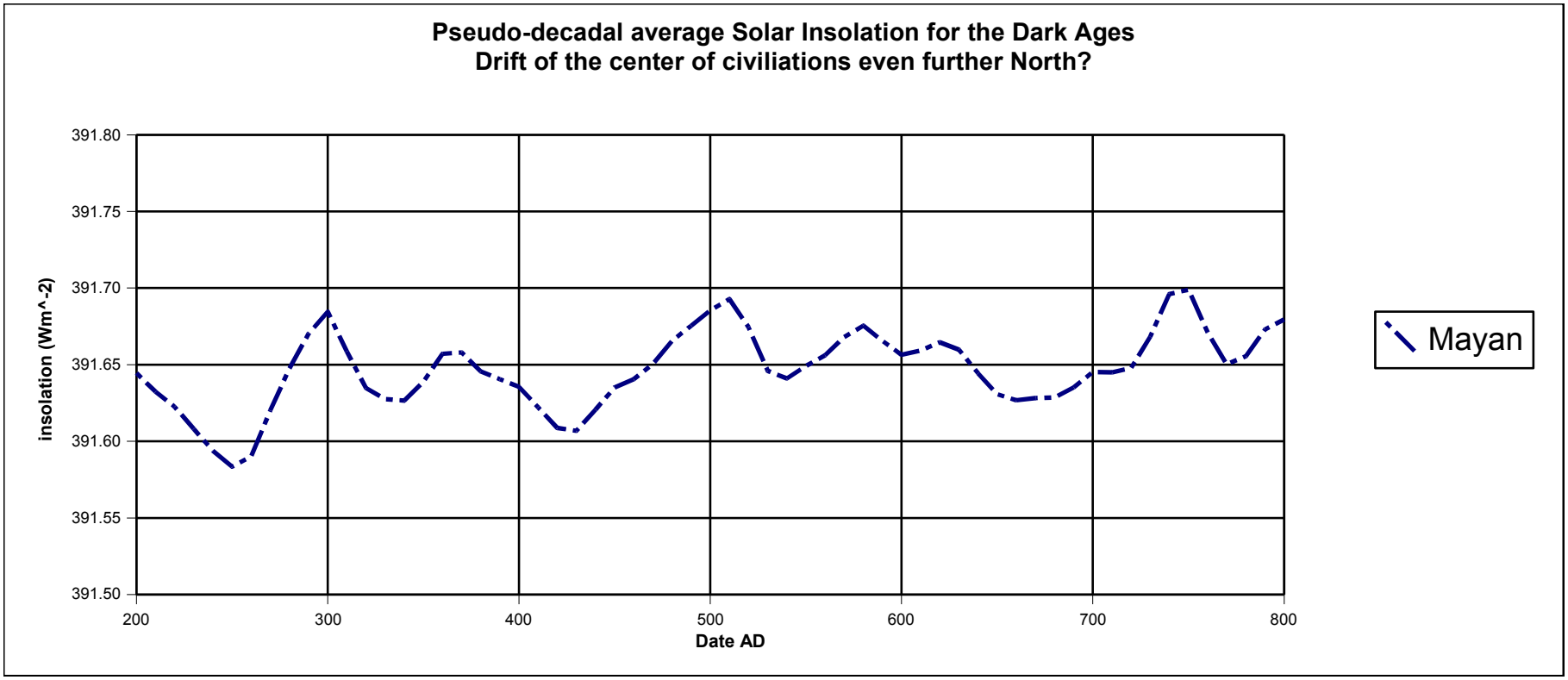


Funny, on this graph it looks as though the Little Ice Age was a period of a major warming trend. Maybe a separate look at higher latitude will tell a different story. Also, keep in mind that the average temperatures are probably more of a function of the total global irradiance, which may not have quite the same trend. Another question is the coincidental galactic ray changes.

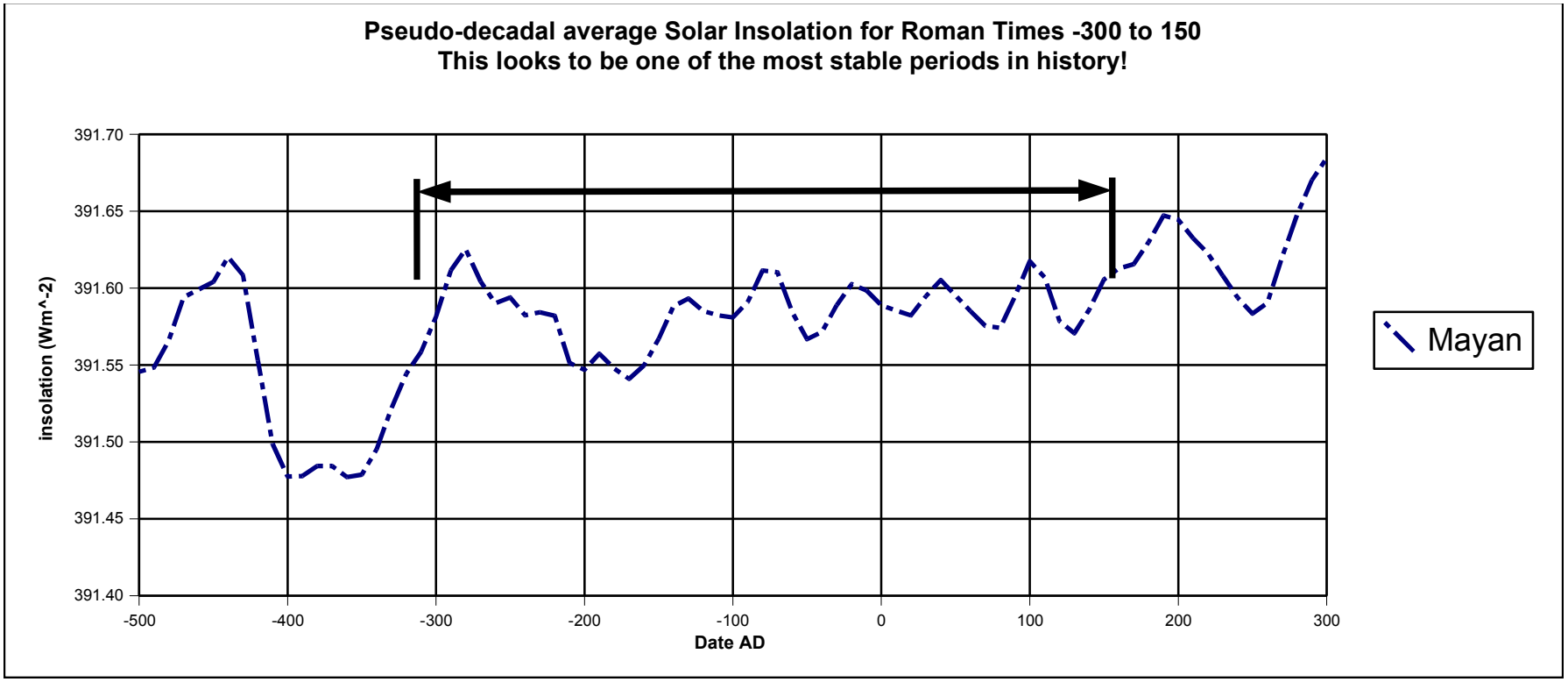


OK, so this needs a new subtitle... The Viking ares a great example of a major population explosion that seems to go bad once the climate goes the other way, driving them to invade and conquer neighbors. Or is that the wrong way around, as with the Roman expansion during a stable climate and bountiful period during their growth and world dominance?

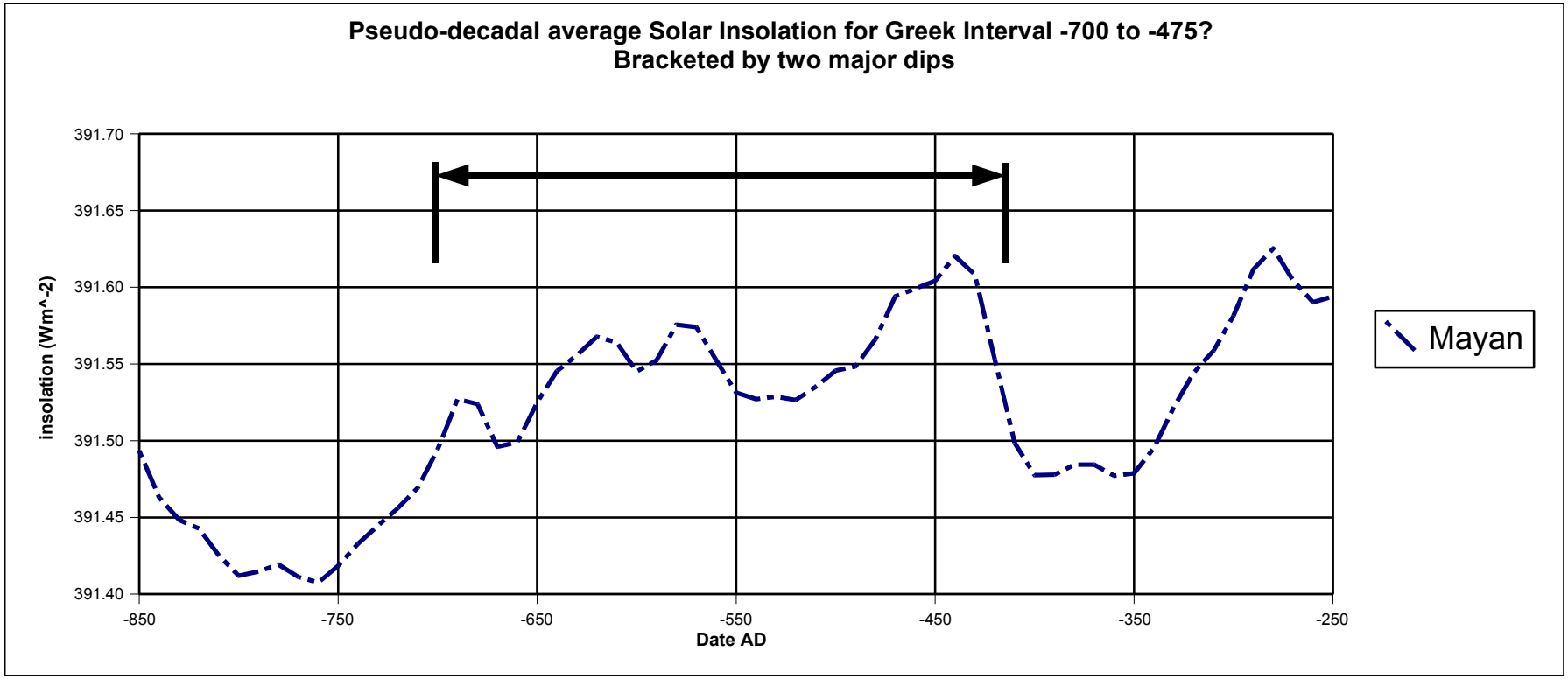
Of course, this is the period of the rise of Islam. Strangely, but the Islam regions would presumably have been even more hard hit by dry climates than in the past - which seemingly contradicts the theme presented in this paper, and especially of the last paragraph.



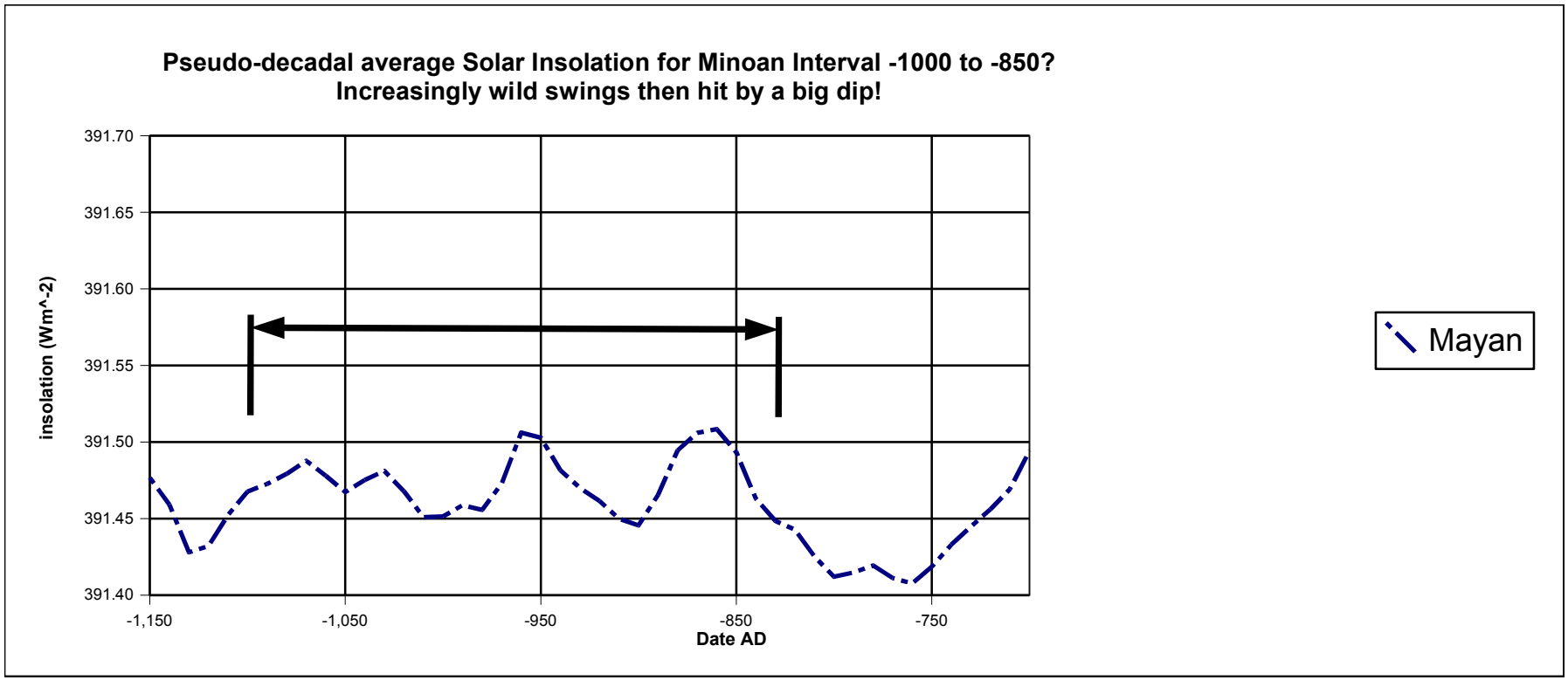
The dark ages looks like a period of relative solar stability, which seems more common for stable civilizations. What gives? Perhaps one issue is the gradual Northerly (and higher-altitude) drift of the center of civilization - a roll-over of leadership to peoples who did not have the same cultural and educational traditions?



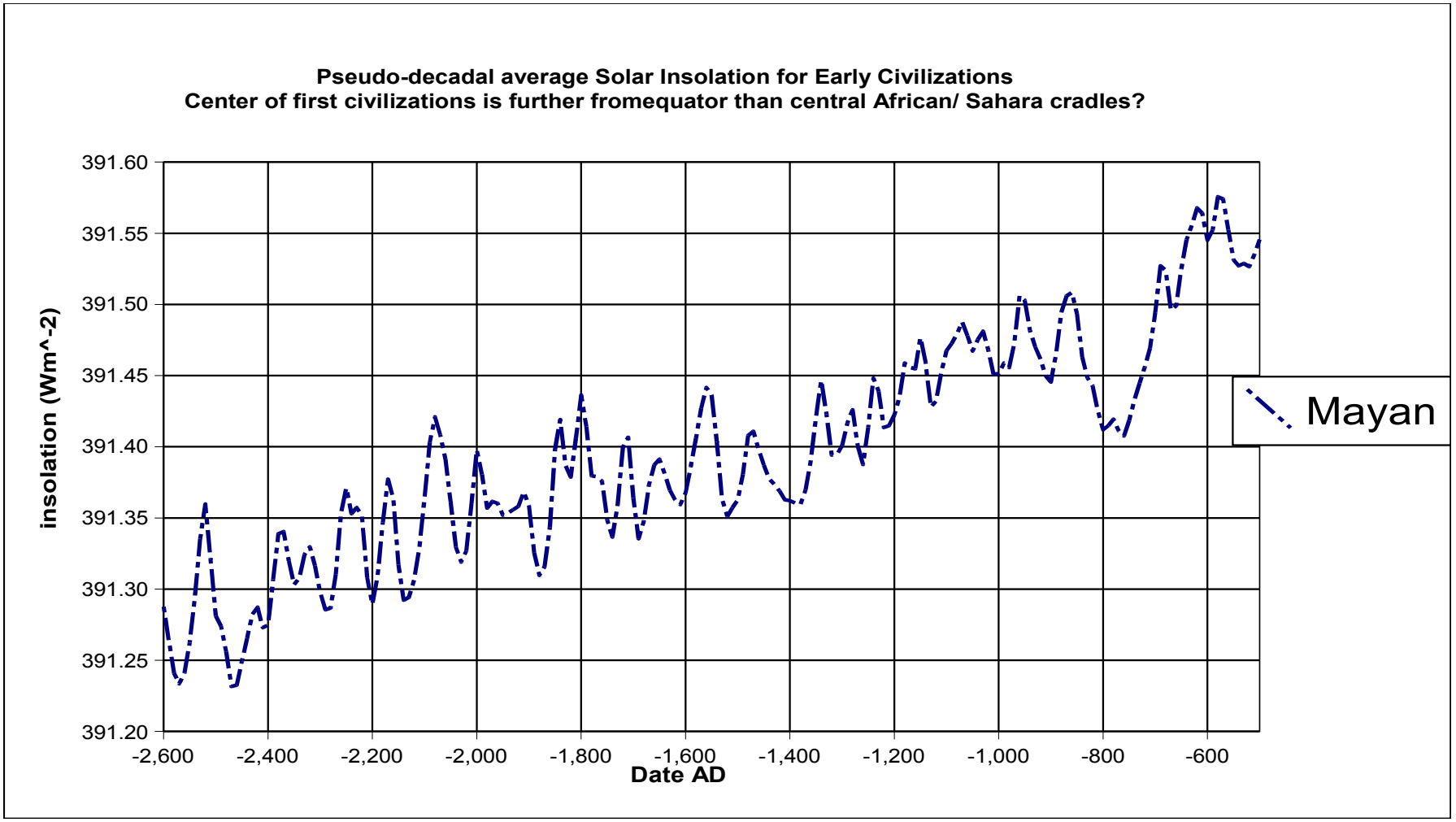
As the caption says, the Roman Era seems to be one of the more stable insolation periods in history. It was preceded by what looks like a major solar minimum. Is the breakup partly due to crop failures or lower productivity due to changes in precipitation in the traditional "Roman stomping grounds", with greater productivity in more northerly regions that fed their rising economic, military and political clout?



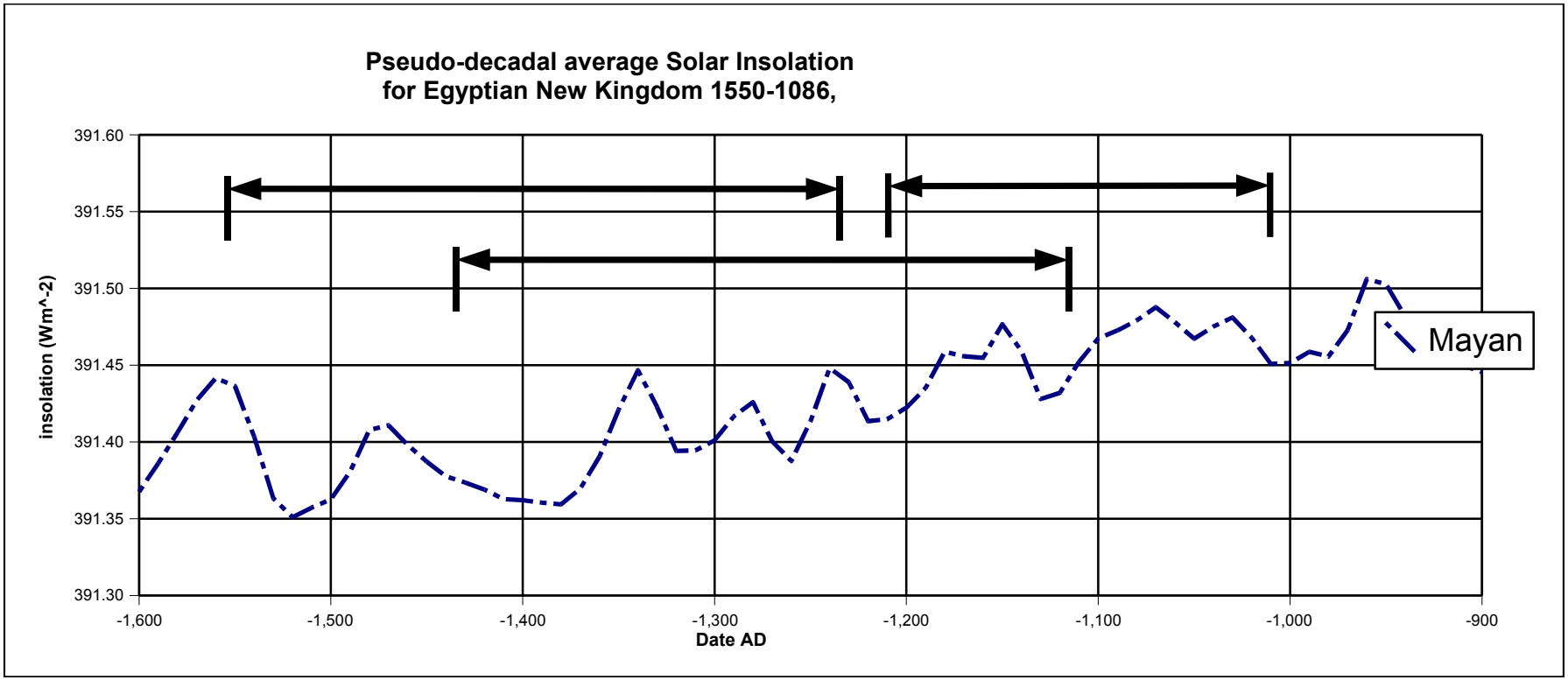
The Greek Era is a short, but relatively stable period bracketed by major and presumably disruptive apparent solar minima.



This is a guess - I don't know the dates, states, and times at all.

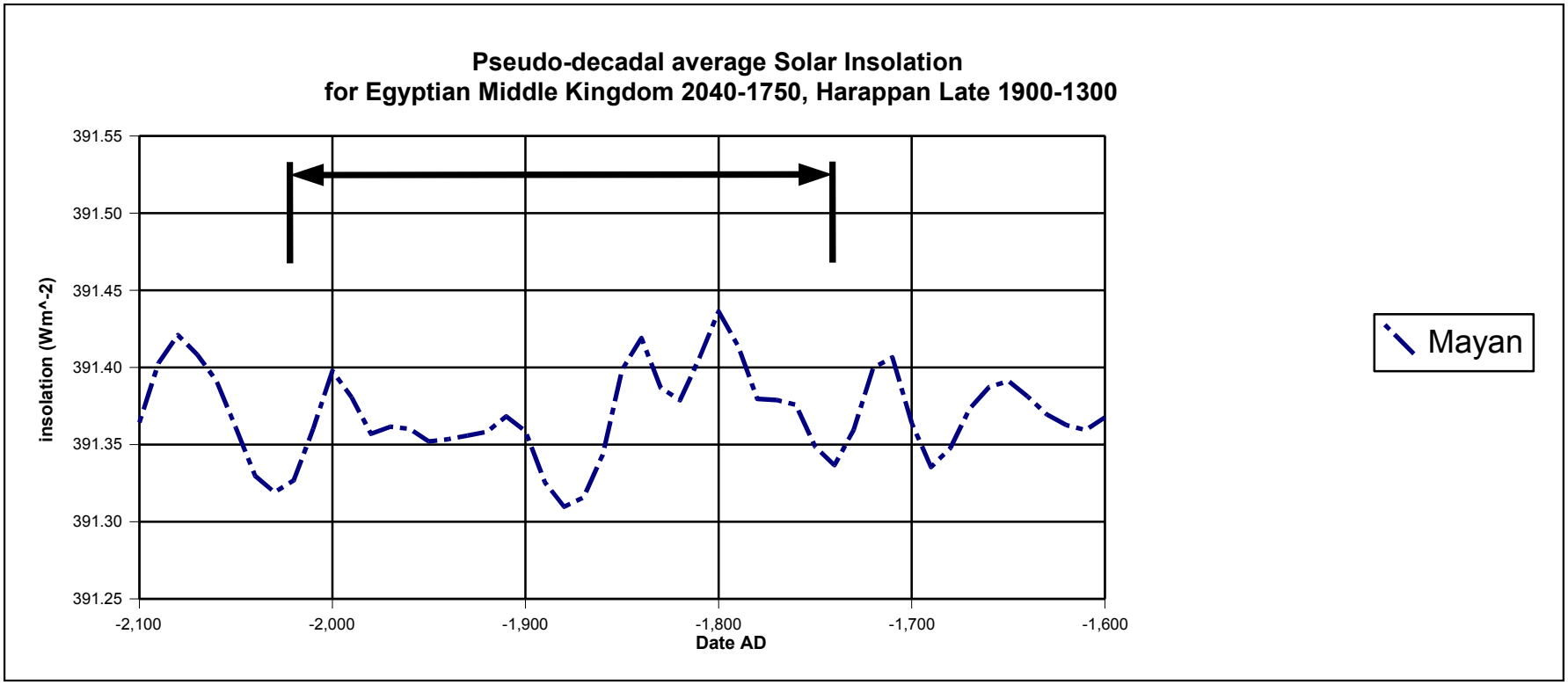


This is a bird's eye view of a span in time covering many ot the Old, Mid, and Late Stages of many of the first great civilizations.

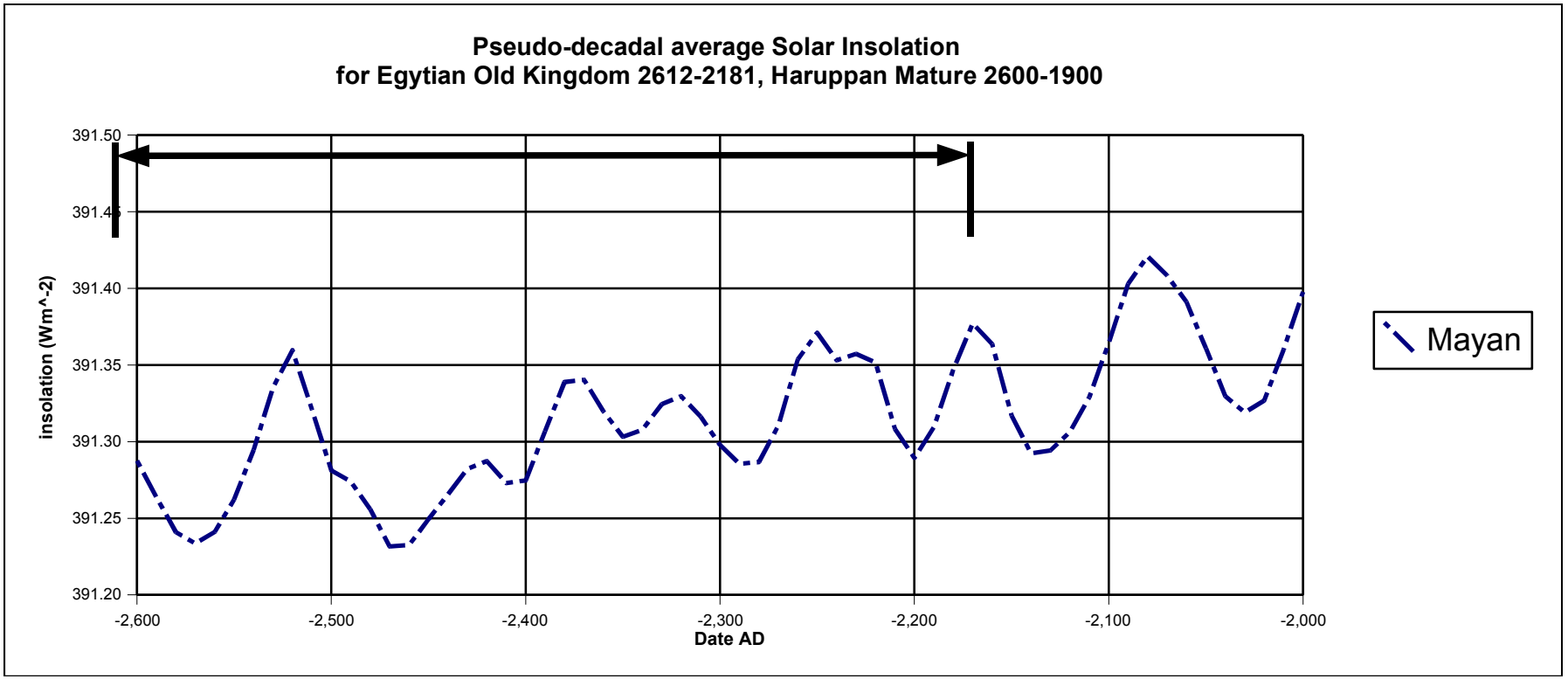


How to split this quite diverse period? For the Egyptians, this was at the tail end of their glory as I understand it, with control going to the upper Nile region in Ethiopia (?Blue Nile?) following yet another collapse in the heart of Egypt. Some comments have been made regarding the failure or extra strong El Ninos just prior to this period. But the movement of control is towards the Equator during a warming period!! Is that because the altitude compensated, or because the torrential El Nino effects were lessened, giving better moisture distribution and crop productivity (Rebecca Bradley made some comments along those lines, but I may have this all wrong).

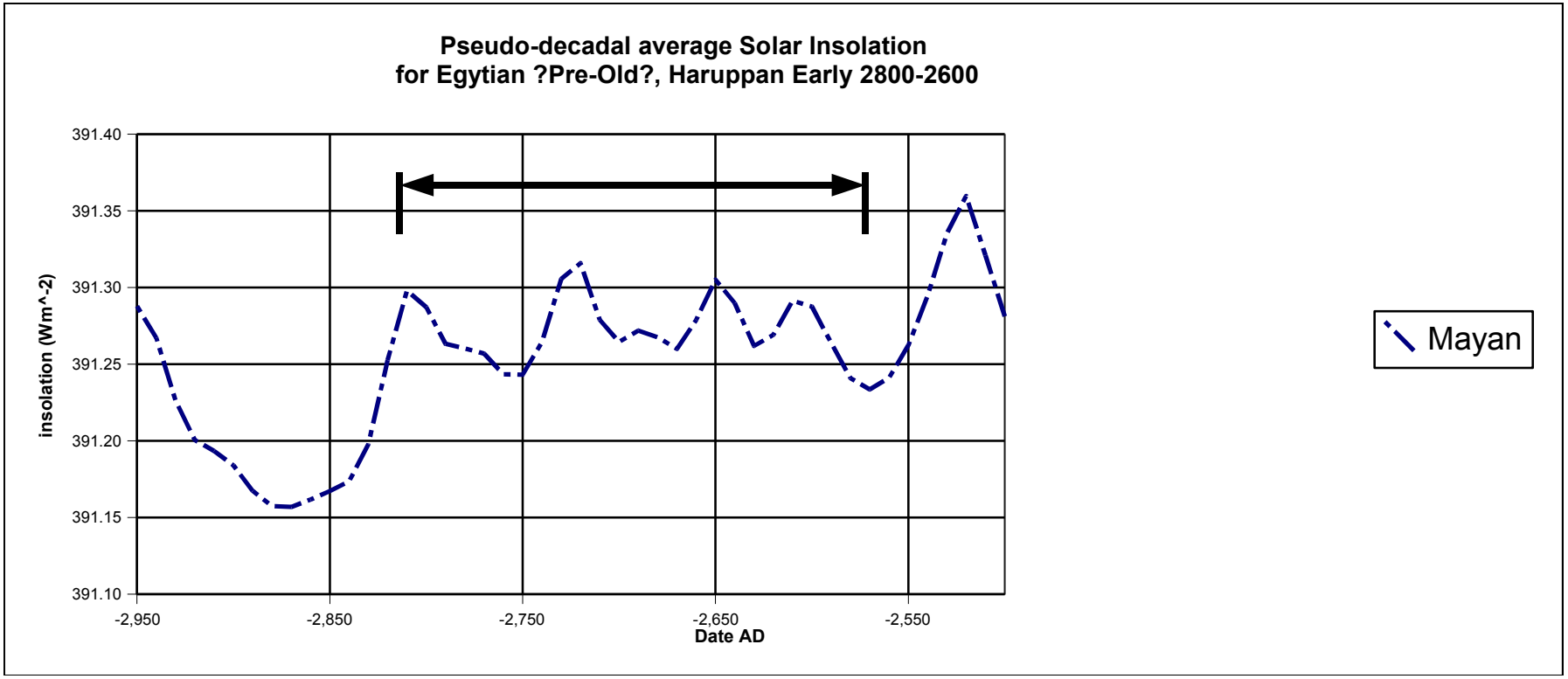
Was there a progressive desertification in parts of Egypt, and a consequent impoverishment overall?



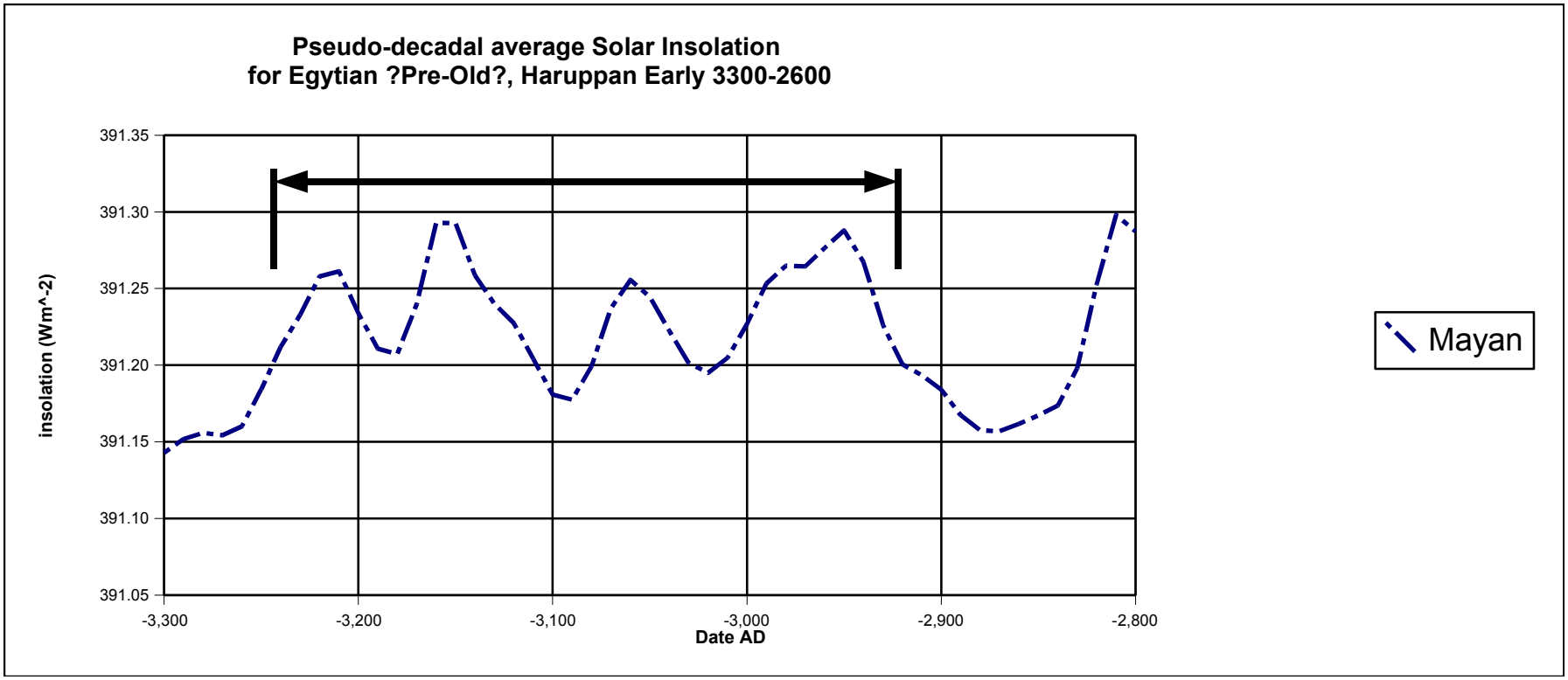
Some pretty big swings right in the middle of this Age..



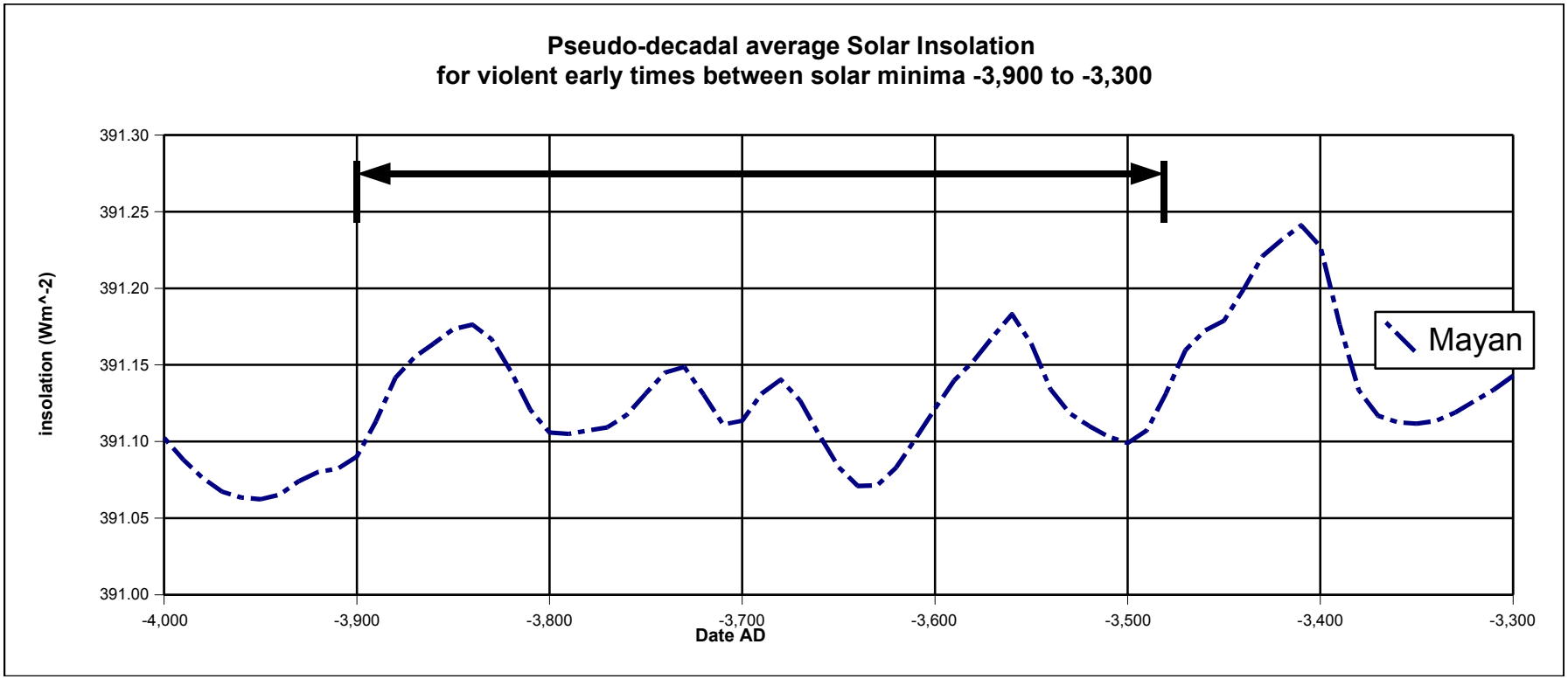
Wow, some pretty big swings in what is one of the greatest periods of history! But then again, the big pyramids were built towards the end of this period?

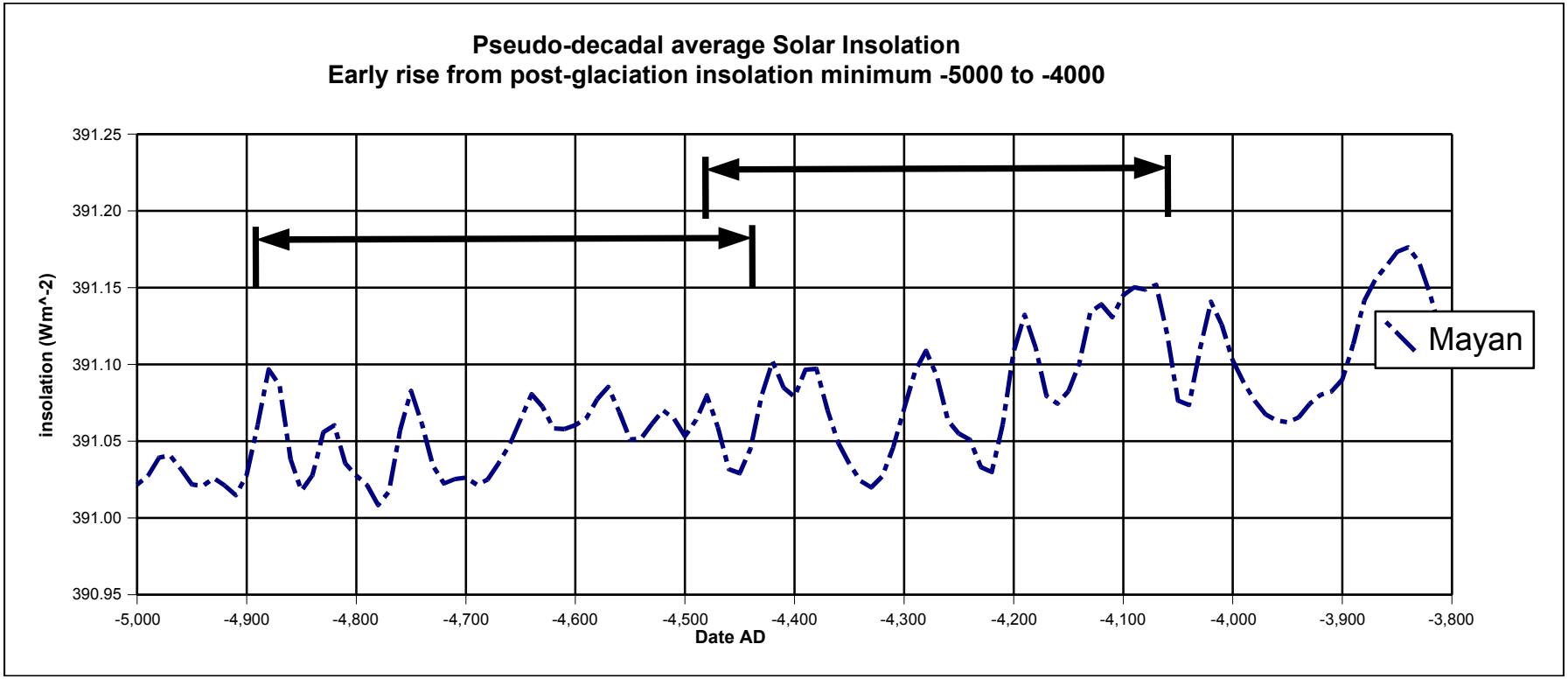


A very stable period leading into the first great civilizations!!



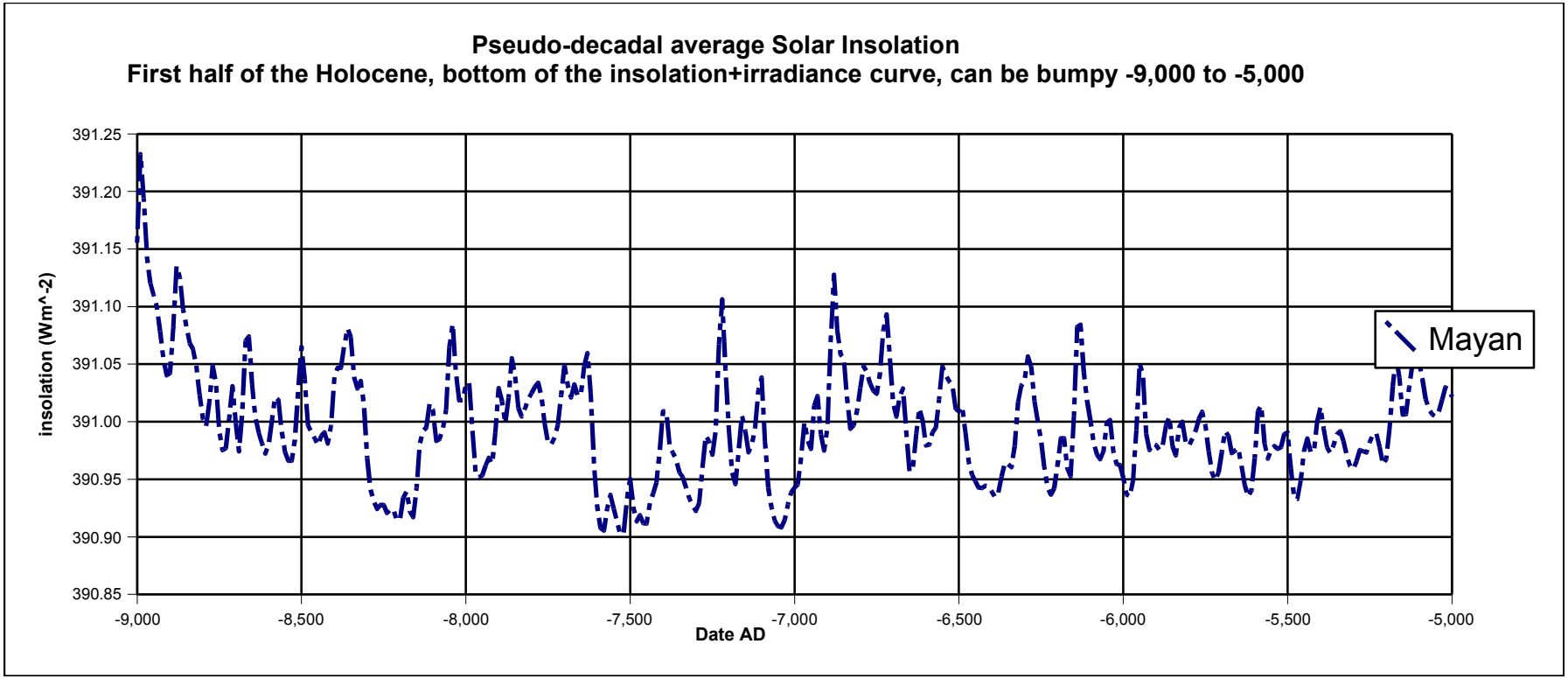
An earlier very stable period! Great for starting up your empire...


Pseudo-decadal average Solar Insolation
for violent early times between solar minima -3,900 to -3,300
insolation (Wm^-2)
391.30
391.25
391.20
391.15
391.10
391.05
391.00
-4,000
-3,900
-3,800
-3,700
-3,600
-3,500
-3,400
-3,300
Date AD
Mayan



We need information on the early African civilizations that have often been forgotten.

Note that the insolation+irradiance is fairly instable for the second period denoted above.



The "average" insolation stays the same for a VERY long time, but it isn't all smooth sailing. Is the -6,000 to -5,500 year period especially conductive to the formation of more complex societies?

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