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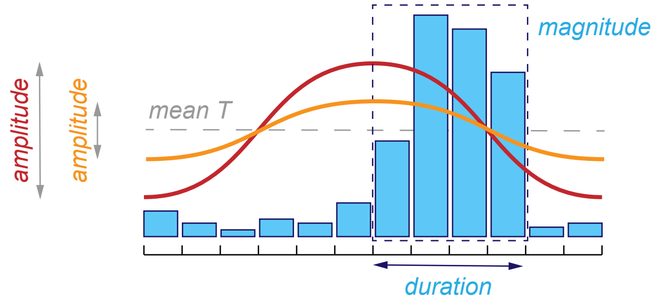
What we talk about when we talk about seasonality?

Hmm... I do not know how to explain these shifts in my paleorecord.... wait, wait! A **change in seasonality!** That's it! Seasonality does change on millennial times scales, right?

It does. But seasonality of what? Of the **temperature** or of **rainfall**? Or both? How does it change?
And, more importantly, how can I test it?
Is my archive adequate for recording seasonality changes? Does it have sufficient resolution?

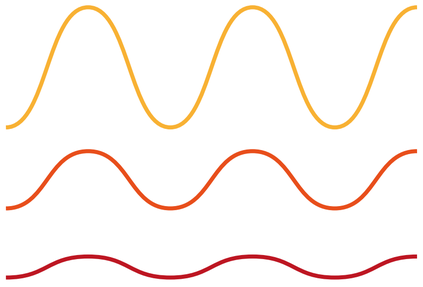
Seasonality of temperature refers to the amplitude between annual maxima and minima. As the annual budget reaches zero and colder winters counterbalance warmer summers, the annual means are suboptimal to trace seasonal changes.

Seasonality of rainfall refers to the magnitude (amount) and temporal distribution (timing – when: duration – how long) or rainfall throughout the year. Rainfall seasonality is not always symmetric. Reconstruction of past rainfall seasonality requires sub-seasonal (monthly) resolution.



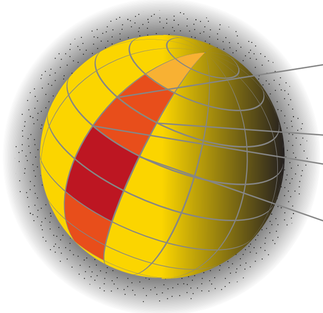
EXTERNAL FORCING

seasonal insolation changes



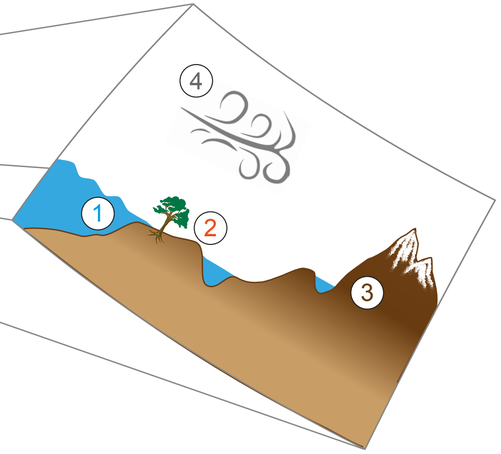
INTERNAL FORCING (global)

atmospheric CO_2 concentration



INTERNAL FEEDBACKS (regional/local)

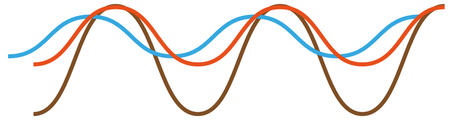
land cover/ medium, continentality, altitude
atmospheric circulation



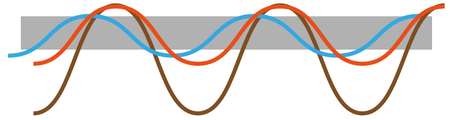
TEMPERATURE VARIATION

seasonal

experienced at the site



recorded by the archive*



Power received from the sun per unit area **(insolation)** is kept in check by the atmospheric **CO_2 concentration**.
Insolation changes are periodic and fixed for a given latitude. In pre-industial times **CO_2 concentration** varied little between the hemispheres, following the respective vegetation season, but the large variation in CO_2 are global.
The influence of past **insolation** and CO_2 changes on the seasonality of Earth's temperature at a given latitude and time is prescribed.
Do shifts in my paleorecord follow these prescribed patterns? Yes? Fine!

No? They do not? The Earth's unit area is rarely homogeneous. **Land cover**, **continentality** and **altitude** can buffer, amplify or delay the 'perfect' seasonal variation of temperature at my site. Further, my archive may be biased towards a certain temperature range. **Perhaps shifts in my record reflect a profound change in local/regional environment** (e.g.: a sensitivity threshold) **rather than a change in seasonality?**