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Corrigendum

Corrigendum to "Both differential and equatorial heating contributed to African monsoon variations during the mid-Holocene" [Earth Planet. Sci. Lett. 522 (2019) 20–29]

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This corrigendum fixes two errors in Fig. 5 of the paper, which have been corrected in Fig. 1 here:

1. In Fig. 5a, a contouring problem gave the erroneous impression that at 0 kya, insolation changes relative to now do not vanish in the southern extratropics. This has been resolved by increasing the number of contour levels in the new Fig. 1, without any changes to the data.
2. In Fig. 5b, the labels for the fractional changes in solar differential and equatorial heating were swapped.

1. Implications

The labeling error in the original Fig. 5 highlights a sensitivity to how the seasonal average is defined, which was not properly accounted for in the original paper. Boreal summer is defined in the paper as July–September. For reference, Fig. 2 is the same as Fig. 1, but for June–August averages. The key difference between the two seasonal averages is that the fractional changes in differential solar heating peak around 4 kya for July–September averages (Fig. 1), and around 7 kya for June–August averages (Fig. 2).

The analysis of PMIP3 simulations in the paper is based on mid-Holocene (6 kya) orbital parameters. However, the greening of the Sahara is estimated to have peaked much earlier, around 9 kya (Marcott et al., 2013). Thus, the June–August seasonal averages appear more in accordance with paleo-records. A conceptual model that resolves the seasonal cycle would be preferable to answer

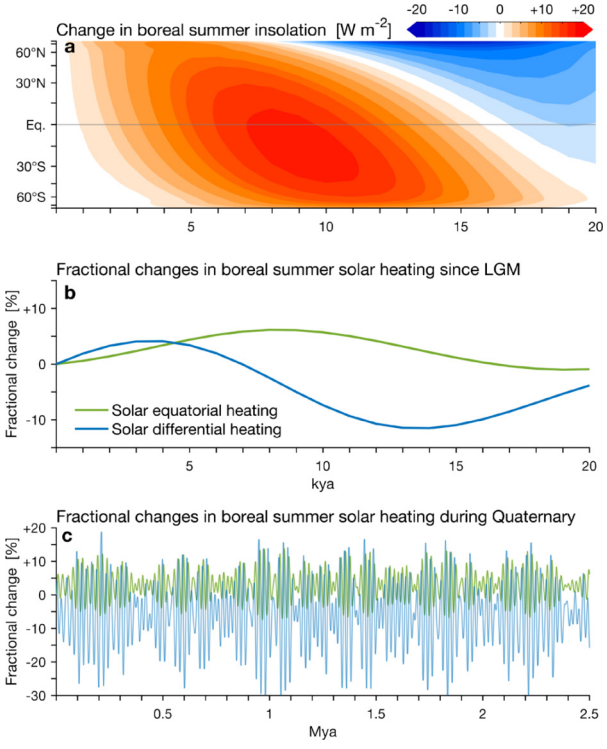

Fig. 1. Historic changes in July–September insolation. (**a**) Change from present-day conditions in zonal-mean insolation since the last glacial maximum (LGM). (**b**, **c**) Fractional changes (from present day) in differential and equatorial heating since the LGM and during the Quaternary (past 2.5 million years). The insolation variations are calculated following the methods described in Huybers and Eisenman (2006).

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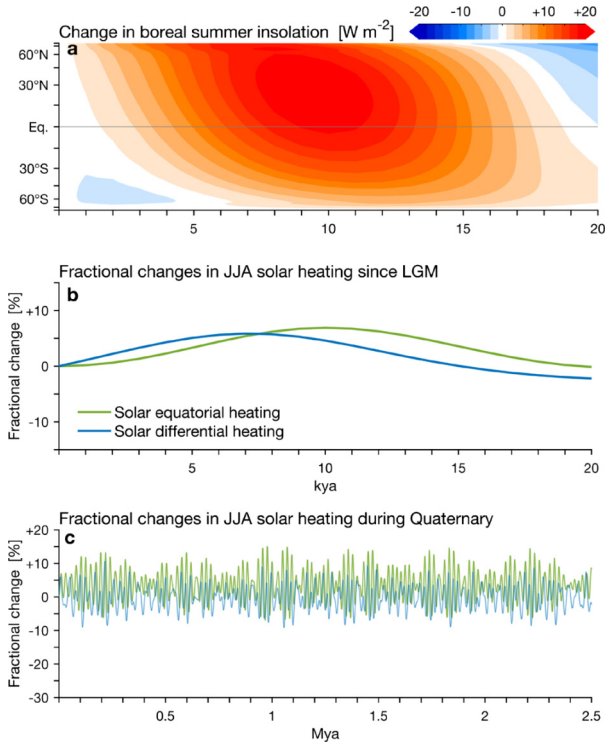

Fig. 2. Historic changes in June–August insolation. (**a**) Change from present-day conditions in zonal-mean insolation since the last glacial maximum (LGM). (**b**, **c**) Fractional changes (from present day) in differential and equatorial heating since the LGM and during the Quaternary (past 2.5 million years). The insolation variations are calculated following the methods described in Huybers and Eisenman (2006).

such questions (e.g., Bischoff et al., 2017). Nevertheless, the key conclusions of the paper regarding the importance of both differential and equatorial heating are not sensitive to how the seasonal average is defined.

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References

Bischoff, T., Schneider, T., Meckler, A.N., 2017. A conceptual model for the response of tropical rainfall to orbital variations. J. Climate 30 (20), 8375–8391. https://doi.org/10.1175/JCLI-D-16-0691.1.

Huybers, P., Eisenman, I., 2006. Integrated summer insolation calculations, NOAA/NCDC paleoclimatology program. Available online at ftp://ftp.ncdc.noaa.gov/pub/data/paleo/climate_forcing/orbital_variations/huybers2006insolation/huybers2006b.txt.

Marcott, S.A., Shakun, J.D., Clark, P.U., Mix, A.C., 2013. A reconstruction of regional and global temperature for the past 11,300 years. Science 339, 1198–1201.