Eocene global cooling event registered in the red clay sequence near Tibet

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We report a long cooling event registered in magnetic susceptibility (MS) data from a continuous eolian sequence near Tibet. The section was accurately dated using magnetistratigraphy and cyclostratigraphy. The MS and frequency dependence of the MS data mimic the general global climate cooling trend in the Eocene. Therefore, the global cooling was suggested to be the leading factor of aridification in the region overwriting the previously proposed dominant role of the Tibetan Plateau uplift (Li et al., 2018). Our high resolution MS record exhibits Asian monsoon intensification variations linked to eccentricity cycles. We show that global cooling reached its maximum at ~ 45 Ma ending up with a sharp warming event. Our analysis shows that this cooling event is also pronounced in the global oxygen isotope record and it is associated with alterations of geomagnetic reversal rate and plate tectonic motion speed. The tectonic changes appear to lag behind the changes in climate and geomagnetic reversal rate and could be driven by the climate change feedback mechanism proposed in Chen et al. (2015) that is linked to multimillion cyclical reorganization of the Earth’ s interior.

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