



The northward shift of the Tibetan Plateau as an important factor for understanding East Asian climate during Cenozoic

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Previous climate modeling studies suggest that the surface uplift of the Himalaya–Tibetan plateau (TP) is a crucial parameter for the onset and enhancement of the East Asian monsoon during the Cenozoic. However, most of these studies have only considered the Himalaya–TP in its present location despite numerous geophysical studies that reconstruct the Himalaya–TP 10° or more of latitude to the south during the early Paleogene. We have designed a series of climate simulations that account for not only changes in the surface elevation of the Himalaya–TP, but also the latitudinal distribution of this regionally high elevation. Here we demonstrate that the East Asian climate strongly depends on the latitude of the Himalaya–TP. The northward motion of the Himalaya–TP likely contribute to the reorganization atmospheric circulation in East Asia, thereby leading to intensified inland Asian aridity and enhanced monsoon climate over East Asia. Moreover, our simulations also bring new constrains on the southern margin of a modern-elevation proto-Himalaya–TP in the Eocene.