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Morphotectonic and topographic evolution of the Ethiopian dome since 30 Ma

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The East African Rift System (EARS) is particularly famous because sediments trapped in some of the rift depressions have recorded a major piece of the late Cenozoic mammalian and hominin evolution, as well as associated proxies of climate and environmental changes. The present day landscape along the EARS is spectacular and characterized by axial rift valleys surrounded by variously extended volcanic highlands often culminating at altitude $>$ 3000 m. The development of this unique tectonic and magmatic environment has been triggered since Eo-Oligocene time by the impingement under the East African lithosphere of one large mantle plume (or several smaller one, debate still active and passionate) and the subsequent related volcanic and tectonic activities. Because the emplacement of volcanic piles and the uplift/subsidence of basement can significantly transform and shape the morphology in the course of rifts evolution, the associated environmental conditions in East Africa are intimately linked to its morpho-tectonic evolution.

Behind the timing of tectonic and magmatic activities, central to our understanding of the morphological evolution of East Africa is their impact and influence on changing significantly the topography at a local or regional scale. Along the EARS, the Ethiopian and Kenyan domes represent the major and most spectacular positive topographic anomalies. We would like in this paper to address the development history of such major topographic cells, and particularly of the Ethiopian volcanic province, by presenting and reviewing precise data and arguments conclusive for the understanding of its topographical evolution. Combination of available data suggests that most of the elevation of the Ethiopian highlands is inherited from the early Oligocene volcanic

and tectonic activities (CFB emplacement + large scale basement doming).