



India-Asia convergence in response to magmatism in southern Tibet

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The negative correlation between magmatic productivity and convergence rate, best documented in the eastern Pacific subduction zone, is well established. Thus it is surprising that we find that the magmatic productivity of the Gangdese arc in southern Tibet during 120-40 Ma is positively correlated with the India-Asia convergence rate. In addition, the timing of the magmatic peak at ca. 51 Ma matches the sudden drop in the India-Asia convergence rate. The overall magmatism migrates from south to north and then back to south with time and is characterized by significant mantle input in two stages at 95-85 Ma and 70-43 Ma, respectively. We propose that the high magmatic productivity is controlled by specific subduction geometry involving ridge subduction at 95-85 Ma, slab rollback from ca. 70 Ma, and slab breakoff at ca. 52 Ma. The latter two processes resulted in a gradual crustal thickening through basaltic magma underplating in southern Tibet and implied that the initial India-Asia collision would have to have commenced no later than ca. 60 Ma.