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Role of rigid block in tectonic transformation zone at east Tibet

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In recent decades, plateau margins have attracted attention because the understanding of their dynamics and history provides insights into the modes of crustal deformation responsible for the plateau structure and morphology and more widely into the deformation of continental lithosphere. The slip transformation and strain partitioning mechanism at the eastern termination of the Kunlun fault system remain unclear. Geophysics investigations revealed the Ruoergai Basin as a rigid block; however, insufficient information is available on the role of this block in tectonic transformation zone at east Tibet. We employed the finite element method in our simulations to delimitate the presence of the Ruoergai block and determine how it affects the surrounding area. We found that the Ruoergai block moves independently to the east or northeast, and its motion differs from that of the Bayan Har block in the eastward escape process of this last-named block. The formation and behavior of Awancang fault and Longriba fault seems to impact by the Ruoergai block. The influence of the Ruoergai block in the east margin should not be ignored. The Awancang fault and Ruoergai block absorbed the north vector velocity of the Bayan Har block, after which the Bayan Har block started moving southeast. The strain partitioning at the eastern margin of the Tibet Plateau is progressively complete[A1] from the Awancang fault, Ruoergai block, and Longriba fault area to the Longmenshan block. The presence of the Ruoergai block could decrease the strike-slip rate of the Maqin–Maqu section of the Kunlun fault. Given its influence in the region, the Ruoergai block should be incorporated in future studies on regional deformation and in deformation and tectonic transformation models. Then we compared the deformation and tectonic transformation models in the northern margin of the Tibet Plateau. Proposed a rigid block compression pattern unite the tectonic transformation and deformation issue, further explain most of the fault behaviors in the northern margin and eastern margin of Tibet.