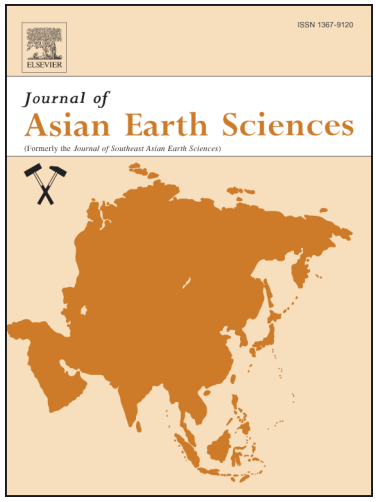

Full length article

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Plate interior polyphase fault systems and sedimentary basin evolution: A case study of the East Gobi Basin and East Gobi Fault Zone, southeastern Mongolia

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Abstract

Structural interpretation of 2-D seismic reflection data and subsurface-outcrop correlations reveal six distinct phases of deformation recorded in the Paleozoic basement rocks and Mesozoic-Cenozoic basin fill of the East Gobi Basin (EGB), southeastern Mongolia. These phases include arc accretion and arc-continent collision in late Paleozoic time, Late Triassic sinistral shear-zone development, Early Jurassic fold and thrust belt style shortening, Middle Jurassic-Lower Cretaceous extension and rift basin development, middle Cretaceous shortening with basin inversion and regional unconformity development, and Late Cretaceous-Oligocene thermal subsidence with renewed Paleogene left-lateral strike slip faulting across the fault zone. The five post-amalgamation deformation phases are localized along the East Gobi Fault Zone, suggesting that preexisting structures and boundary conditions exert fundamental controls on the long term evolution of intracontinental basins such as the EGB. Subsurface geophysical data and outcrop correlations demonstrate that the main subbasins of the EGB contain major differences in basement metamorphic and structural fabrics, basin fill patterns, and distinct Mesozoic-