

Kinematic Constraints on Rodinia Reconstructions from the Core of the Texas Grenville Orogen

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ABSTRACT

Mesoproterozoic metamorphic rocks exposed in the Llano Uplift, central Texas, were involved in a ~1.15–1.12 Ga Grenville-age collisional orogenic event along the southern margin of Laurentia. This event is characterized by polyphase ductile deformation synchronous with transitional amphibolite-, granulite- to eclogite-facies metamorphism. Results of detailed structural mapping in the southeastern part of the Llano Uplift show that these rocks record a deformational history involving northeast-directed ductile thrusting and regional-scale polyphase folding, all related to northward collision of a southern continent and an arc with the southern margin of Laurentia. We use the structural, metamorphic, and kinematic history of the southeastern Llano uplift to critically evaluate collisional models for the Grenville orogen in Laurentia and discuss the implications for reconstructions of Rodinia.