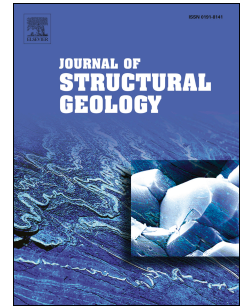


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Activation of preexisting transverse structures in an evolving magmatic rift in East Africa

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1 Activation of preexisting transverse structures in an evolving magmatic rift in East
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9

10 **Abstract**

11 Inherited crustal weaknesses have long been recognized as important factors in strain
12 localization and basin development in the East African Rift System (EARS). However, the
13 timing and kinematics (e.g., sense of slip) of transverse (rift-oblique) faults that exploit these
14 weaknesses are debated, and thus the roles of inherited weaknesses at different stages of rift
15 basin evolution are often overlooked. The mechanics of transverse faulting were addressed
16 through an analysis of the Kordjya fault of the Magadi basin (Kenya Rift). Fault kinematics were
17 investigated from field and remote-sensing data collected on fault and joint systems. Our analysis
18 indicates that the Kordjya fault consists of a complex system of predominantly NNE-striking,
19 rift-parallel fault segments that collectively form a NNW-trending array of en echelon faults. The
20 transverse Kordjya fault therefore reactivated existing rift-parallel faults in ~1 Ma lavas as
21 oblique-normal faults with a component of sinistral shear. In all, these fault motions
22 accommodate dip-slip on an underlying transverse structure that exploits the Aswa basement

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