



Slip evolution and deformation associated with the 2009-2010 northern Malawi earthquake swarm, East African rift

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Interferometric Synthetic Aperture Radar (InSAR) measurements, field observations and elastic modeling of the 2009-2010 Karonga (northern Malawi) earthquake swarm reveal widespread coseismic and localized postseismic deformation. In a period of about 1.5 months starting on November 5, 25 $M \geq 4$ earthquakes struck the region, culminating in an $Mw 6$ peak event on December 19. The next few months were characterized by significant localized deformation with a very low seismic moment release. We find a very good agreement between InSAR and field observations of surface ruptures. Our best fitted coseismic models indicate dip-slip displacements on a fault dipping 40 degrees to the southwest with maximum slip of about 120 cm at 3-5 km depth. Fault activity continued until August 2010 as shallow aseismic afterslip mostly above the maximum coseismic slip patches. In contrast with other recent earthquake swarms along the East African Rift, the Karonga swarm shows no direct effect of any intrusive magma body.