



The Core Complex-Colorado Plateau Connection: A radiating wave of ductile lower crust

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We propose that the prominent topographic relief of the Colorado Plateau above the Basin and Range province in the Miocene generated a wave in the ductile lower crust, which spread radially outward creating the Core Complexes of southwestern US and wide depressions on the Plateau itself. We model the propagation of this lower crustal wave with a numerical solution of the lubrication approximation of the Navier-Stokes equations and find good agreement between this solution and the thickness of the lower crust as imaged by seismic data. Our model is consistent with: 1) the downward decreasing deformation of the Core Complexes detachments, 2) the opposite sense of shear found on paired Core Complexes respectively closer and farther away from the Plateau, 3) the early compression and subsequent extension recorded in the mylonites, 4) the older age of the mylonitization relative to the detachments, and 4) the lack of extension on the Plateau during the formation of the Core Complex detachments. In fact, this model does not require (although it would be facilitated by) extreme extension and erosion during low-angle detachment faulting.