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## Mesozoic fabric influence on the formation and geometry of the Quaternary Cucamonga Fault

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Ancient basement rocks in Southern California contain mechanical anisotropies that may influence the architecture of Quaternary faulting. We study exposed basement rocks found within the southeastern San Gabriel lithotectonic block with the intention of reconciling the relationship between inherited ductile fabrics and the geometry of Quaternary faults that are part of the San Andreas Fault system. By focusing our study on the southeastern corner of the San Gabriel block we can study the exposed lower- to middle crustal shear zone fabrics near where the Cucamonga Fault and the San Jacinto Fault intersect.

The brittle Quaternary Cucamonga Thrust Fault strikes E-W and dips to the north-northeast (35-25°) is localized at the range front and cuts these older fabrics, however there is also brittle deformation distal from the fault that also affects the sequence of lower- to middle crustal (6-8 kbar) granulite- to upper amphibolite facies mylonite and granulite-facies metasedimentary rocks. Near the Cucamonga Fault, mylonitic fabrics strike E-W and dip northeast (40-50°). Quaternary brittle faulting strike E-W and dip northeast (30-40°) reactivates the mylonites, and slickenlines record sinistral, top-to-the-west sense of shear. Investigation of host rocks indicates that they formed in the roots of a continental arc which was active from the Middle Jurassic to Late Cretaceous (172-86 Ma) at 740-800 °C. Ductile deformation was associated with granulite-facies metamorphism at approximately 30 km depth during the Late Cretaceous (88-74 Ma) at 730-800 °C. Our work shows that the exhumed Late Cretaceous mylonitic fabrics may have operated as stress guides during Quaternary faulting in the Cucamonga Fault zone. We conclude that these lower crustal fabrics influence the geometry and kinematics of late Cenozoic faulting of the Cucamonga and San Jacinto fault zones.

### Key Words

thrust fault, brittle fault, fabric influence, ductile fabrics

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