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New structural constraints on the collision and accretion of the Alisitos arc with North America from the Colonet area, Peninsular Ranges batholith, Baja California, MX

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Several NW-trending litho-stratigraphic basement assemblages comprise the Peninsular Ranges batholith of southern and Baja California. One of these assemblages is the Cretaceous Alisitos arc that occupies much of the western part of the peninsula between the latitudes of about 28°30'N and 31°45'N. The arc collided with the North American continent between ~115 and 103 Ma and a well-developed fold-thrust belt formed along the northern and eastern edges of the arc as a result of the collision.

Recent mapping in the Colonet area, located in the northeastern corner of the arc, revealed several important results. 1) The suture, which separates the arc from strata with North American affinities, and the associated fold-thrust belt curve in this area from a NNW-SSE trend along the east side of the arc to a NW-SE trend along the northern edge of the arc. 2) Outcrop- to kilometer-scale folds tighten NE-ward from open, upright folds to isoclinal, overturned, SW-vergent folds near the suture. 3) Several brittle to ductile high strains zones where foliation and lineation are strongly developed occur throughout the fold-thrust belt. 4) Overall, foliation and lineation fabric intensities do not dramatically increase toward the suture. Instead, the development of structures is controlled by composition. Rheologically weak units, such as shale, develop good cleavage and strong units, such as volcanic flows, develop no or little fabric at the outcrop scale. 5) Outcrop-scale observations suggest that ductile strain is partitioned between rheologically weak and strong units.

Our observations from the Colonet area are consistent with previous work in the Alisitos arc that concluded that the arc collided with North America in the Cretaceous and that collision resulted in the formation of a fold-thrust belt. However, we suggest that accommodation of deformation including strain is complex and does not simply increase towards the suture. Rather, rheology and possibly local effects such as proximity to plutons or location on the fold (i.e. hinge or limb) strongly control the development of structures in the arc.