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EXHUMATION OF THE COYOTE MOUNTAINS METAMORPHIC CORE COMPLEX (AZ): IMPLICATIONS FOR OROGENIC COLLAPSE OF THE SOUTHERN NORTH AMERICAN CORDILLERA

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The Coyote Mountains is a metamorphic core complex that makes up the northern end of the 80-km long Baboquivari Mountain complex (Southern AZ). The Baboquivari Mountain complex is composed of Mesozoic and Cenozoic igneous and metasedimentary rocks, including the Pan Tak granite and associated pegmatite, a muscovite-biotite-garnet peraluminous granite. Previous work show that the Pan Tak Granite, where the Coyote Mountain detachment shear zone is localized, was emplaced in Late Cretaceous / Ealry Eocene (~58 Ma zircon crystallization age). Geochemistry of the Pan Tak granite and other intrusions within the Baboquivari Mountains suggest that it was formed by anatectic melt representing the culmination of a Laramide crustal shortening orogenic event that started in the Late Cretaceous, about ~70 Ma. Field evidence, as well as petrographic and microstructural analyses of metamorphic and deformational fabrics/structures show that the ~58 Ma intrusive/magmatic fabric is overprinted by a secondary tectonic event. This event is particularly well recorded in the northern part of the Coyote Mountains, where a north-dipping mylonitic shear zone is exposed. In this study investigates the tectonic of the Coyote Mountains through its microstructural record. Based on $^{40}Ar/^{39}Ar$ geochronology of muscovite, our results indicate that Tertiary mylonitization associated with the formation of the Coyote Mountains metamorphic core complex occurred at 29 Ma (Early Oligocene). Mylonitization is recorded by a suite of microstructures that suggest that the detachment shear zone evolved close to the brittle-ductile transition, at deformation conditions of ~500 ± 50°C, and high stress/high strain rate, and depth of ~10-13km. These preliminary results suggest that plutonism may have initiated thermal and mechanical weakening of the crust, which eventually triggered rapid extension.

Session No. 216
T58. Late Cretaceous to Early Paleogene Tectonic Development of the North American Cordillera II
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Back to: T58. Late Cretaceous to Early Paleogene Tectonic Development of the North American Cordillera II

<< Previous Abstract | Next Abstract >>