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EVOLUTION OF CONTINENTAL RIFTING TO SEAFLOOR SPREADING: THE SOUTH SAN CLEMENTE RIFT, CALIFORNIA CONTINENTAL BORDERLAND

South San Clemente Basin resembles a large rhombochasm centrally located in the California Continental Borderland. Seafloor morphology consists of a symmetrical pair of N10E-trending troughs separated by an axial ridge between the N55W-trending San Clemente and Animal Basin dextral transform faults. The north-trending ridge and basin morphology represents continental rifting as observed in the Basin and Range at a scale comparable to Death Valley. Yet, nested N35E-trending sub-basins and narrow grabens cutting the sedimentary fill and offset by NW-trending high-angle faults within the two troughs strongly resemble the Guaymas Basin and may indicate nascent seafloor spreading. The central ridge, dominated by three large sub-circular peaks, may be a chain of ridge crest volcanoes, or alternatively, a metamorphic core complex consisting of domal schist basement and plutonic uplifts similar to the that of the Inner Borderland Rift to the north. Dredge samples obtained from the crest and flanks of these peaks consist of fragments of the regional Catalina Schist basement as well as andesitic volcanic rocks and some well-rounded cobbles of gabbro and other coarse-grained igneous rock types. Other broad ridges flank the major basin troughs and show prominent northeast-trending structural fabric, orthogonal to the San Clemente fault trend and inferred relative motion of the Pacific plate. These complex ridges are tentatively considered to be tilted fault blocks, like dominoes, of older pre-rift crust or syn-rift volcanic rocks lying above a major sub-horizontal detachment fault system.