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DETRITAL THERMOCHRONOLOGY IN A TRANSCURRENT PLATE BOUNDARY: INTERACTION FROM CARIBBEAN AND SOUTH AMERICA PLATES CONTROLING THE CENOZOIC EVOLUTION FROM SIERRA NEVADA DE SANTA MARTA, COLOMBIA.

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The complex interaction between the Panama - Choco block, the Caribbean, the South American, and the Pacific plates on the NW margin of South America recorded an alternation of subduction, collision and tectonic transcurrent events during the Late Cretaceous and Cenozoic. This geodynamical complexity has resulted in the presence of a series of isolated massifs, limited by regional faults and surrounded by Cenozoic sedimentary basins in northernmost South America. The Sierra Nevada de Santa Marta (SNSM) is part of these isolated massifs and consists of a series of igneous and metamorphic rocks limited by dominantly strike-slip regional faults systems, the Santa Marta - Bucaramanga fault to the west and Oca - Ancon fault to the north. The Neogene evolution of the SNSM is directly associated to subduction and right lateral migration of the Caribbean plate against South American. Along the Oca – Ancon fault, in the northern side of the SNSM, Neogene basins associated with the movement of this fault occur and host the sedimentary record of exhumation of surrounding ranges. These basins are made up of up to 1 km of southerly sourced siliciclastic conglomerates, sandstones and mudstones accumulated in fluvial and transitional environments during the Miocene - Pliocene. The detrital signatures of detrital zircon U-Pb ages AFT ages and heavy mineral composition from the rocks exposed to the north and south of the Oca – Ancon fault show a change in the provenance, possibly associated with differences in unroofing linked to the dextral component of this structure, which would have led to paleodrainage reorganization. This interpretation is consistent with the structural models proposed in this area, suggesting a clockwise rotation and displacement of hundreds of kilometers of the SNSM, associated with eastward migration of the Caribbean plate. We compare the Cenozoic provenance signature with that of modern river sand collected in 5 river drainings at the north face of the SNSM off to the Caribbean sea. A mismatch between modern and ancient signatures from the same locality is interpreted in terms of right lateral displacement of the Oca-Ancón fault. Finally, new detrital thermochronological data (AFT and AHe) together with existing data reveal a pulse exhumation at ~ 27-16 Ma and an increase in the lag-time, i.e., an increase in the difference between the youngest cooling age in the detrital signature and the age of the sedimentary rocks or sediments that contain it. This pattern document a post-middle Miocene decrease in the exhumation rates, as compared with the prevailing rates obtained for the early Miocene. Ongoing research will reveal the potential forcing factors responsible for this tectonic cycle.