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Provenance changes for sandstones from the Sierra de los Cuarzos (central Mexico): the possible record of a terrane accretion

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The Guerrero terrane is composed of Late Jurassic-Early Cretaceous arc successions exposed along the western Pacific margin of Mexico. Several lines of evidence indicate that the Guerrero terrane represents the Mexican leading-edge of the North American plate, which was drifted in the paleo-Pacific domain during Late Jurassic-Early Cretaceous back-arc spreading, and subsequently accreted back to the Mexican continental core before the Albian. In this paper, we present new stratigraphic data and a detailed provenance analysis of sandstones from the Sierra de Los Cuarzos area, which is located in central Mexico, ∼50 km to the east of the Guerrero terrane suture belt. In the Sierra de Los Cuarzos is exposed a Mesozoic succession composed of: 1) quartz-rich turbidites grading upward to 2) calcareous slump deposits, which are overlain by 3) volcaniclastic sandstone and scarce conglomerate hosting 20 cm- to 100 m-wide blocks and slabs of basalt. Sandstone provenance and paleocurrent marks indicate that turbidites and slumps deposits were fed by sources from the Mexican continental core. Similar Late Jurassic-Early Cretaceous turbidites and calcareous slump deposits are exposed in the Sierra de Guanajuato, ∼50 km to the west of the Sierra de Los Cuarzos area, and are preliminarily correlated with the lower units (1 and 2) of the study area. On the other hand, provenance analysis indicates that volcaniclastic sandstones from unit 3 were principally fed by the arc successions exposed in the Guerrero terrane. The drastic change in provenance of sandstones from the Sierra de los Cuarzos suggests a complex depositional history, characterized by the contribution of distinct supplying sources during the infilling of the basin. In this paper, it is explored the possibility of a syn-tectonic origin for the volcaniclastic rocks of the Sierra de Los Cuarzos, related to the accretion of the Guerrero terrane to the Mexican continental core.