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U-Pb Detrital Zircon constraints and sedimentary architecture of the Lower Anti-Atlas Supergroup (Igherm Inlier, Western Anti-Atlas, Morocco)

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The Lower Anti-Atlas Supergroup has recently undergone significant advances regarding age and stratigraphic subdivision. Although it has been extensively studied in the central Anti-Atlas in terms of sedimentology, stratigraphy, and geochronology (e.g., [1, 2, 3]), these studies remain limited in the western part. Here, we propose a formal lithostratigraphic framework for the Lower Anti-Atlas Supergroup in the Igherm inlier, integrating new sedimentological observations with U–Pb zircon geochronological data, supported by regional correlations. Based on our data and correlations between sections, we distinguish five units, from the base to the top: (1) a coarse quartzite unit correlated with the Tasserda Formation; (2) a lower siliciclastic–carbonate unit correlated with the Ifrane n'Taghatine (i.e., Taghdout) Formation; (3) a quartzite unit correlated with the Mimount (i.e., Oumoula) Formation; (4) an upper siliciclastic–carbonate unit correlated with the Tizi n'Taghatine Group; (5) a volcanic unit correlated with the Tachdamt Formation and interpreted as syn-rift magmatic products emplaced during the Tonian, which may represent part of a large igneous province. Detrital zircon age data from different formations of the supergroup show distinctive age distributions that indicate a dominant sediment source from the West African Craton, with a possible contribution from the Amazonian Craton. Regional correlations between the Lower Anti-Atlas Supergroup and the Taoudeni and Volta basins, based on detrital zircon age distributions, reveal striking similarities and support the existence of a vast intracratonic depositional system extending across the West African Craton.

[1] Bouougri & Saquaque (2004), Journal of African Earth Sciences. 39, 227–238.

[2] Bouougri et al. (2020), Gondwana Research. 85, 169–188.

[3] Ait Lahna et al. (2020), Journal of African Earth Sciences, 171, 103946.