Post-collisional magmatism of Neogene-Quaternary age is manifested in a long but disjointed belt of volcanoes broadly paralleling the Arabia-Eurasia suture zone. Volcanic compositions in this belt share geochemical characteristics with subduction-related magmas, yet they postdate subduction and formed in the wake of continental collision. Potential mechanisms for melt generation in the absence of subduction include slab break-off, lithospheric mantle delamination, or incorporation of fusible crustal rocks or sediment into the mantle through subduction or collision, leading to volcanism seemingly randomly distributed in time and space. In northwestern Iran, the two largest post-collisional volcanic centers are Sahand and Sabalan stratocones, which are located at distances of 150 and 300 km on a line perpendicular to the strike of the suture zone, where they overlie rocks of the Eocene-Oligocene Urumieh-Dokhtar magmatic arc. Here, we present U-Pb zircon ages for intermediate lavas and pyroclastic rocks from Sabalan volcano which complement published data for the Sahand and Sabalan systems [1, 2]. In both sample suites, inherited zircon from the basement is scarce and restricted to Cretaceous and Eocene-Oligocene ages for Sahand, and Archean, late Proterozoic and Oligocene-Miocene ages for Sabalan. Individual samples display coherent young populations that likely crystallized shortly before eruption. In addition, many samples show evidence of antecrystic zircon, indicating a long-lived subvolcanic reservoir where older intrusive rocks became recycled. Because of this recycling, the overall zircon age distribution of each volcano better represents the duration of magmatic activity than a compilation of eruption ages would. Based on the oldest antecrystic zircon ages, the onset of magmatism is constrained to ca. 10 Ma for Sahand, and ca. 5 Ma for Sabalan. This age difference shows a progression in the onset of magmatism that is consistent with plate tectonic velocities of ~30 mm/a. This rate and the northeastward direction of the volcanic migration also matches the reconstructed convergence of the Neotethyan oceanic lithosphere towards Eurasia. Apparent pulses in zircon production for both, Sahand and Sabalan, as well as a tailing off in the frequency of older ages are likely due to sampling bias of the volcanic stratigraphy, where younger eruptive products may have destroyed or obscured older units. Regardless of this bias, U-Pb and U-Th disequilibrium zircon ages from both volcanoes consistently indicate late Pleistocene eruptions as young as <173 ka and <110 ka for Sahand and Sabalan, respectively. The systematic younging of the onset of volcanism for these
two volumetric dominant volcanic centers in northwestern Iran suggests that passage of a detached oceanic slab following closure of the Neotethys is a viable mechanism for post-collisional magmatism in the region.
