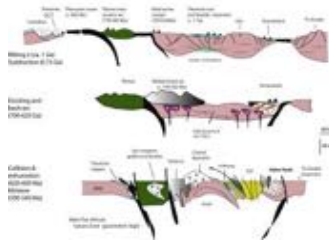


## Neoproterozoic evolution in West Gondwana assembly

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LA-ICP-MS U–Th–Pb analyses of zircon from magmatic and metamorphic rocks of the Adrar des Iforas (North Mali) allow reexamining the relationships between the different crustal units constituting the western part of the Tuareg Shield, as well as the timing of magmatic and metamorphic events in the West Gondwana Orogen. During the Neoproterozoic, the Kidal terrane underwent a long-lived continental margin magmatism. To the west, this terrane is bounded by the Tilemsi intra-oceanic island arc, for which a gneissic sub-alkali granite was dated at  $716 \pm 6$  Ma. A synkinematic diorite extends the magmatic activity of the arc down to  $643 \pm 4$  Ma, and, along with literature data, indicates that the Tilemsi arc has a life span of about 90 Ma. Backward docking to the western margin of the Kidal terrane is documented by migmatites dated at  $628 \pm 6$  Ma. Subduction related processes and the development of the Kidal active margin was responsible for the development of a back-arc basin in the Tafeliant area, with deposition of sediments intruded by basaltic and dacitic lavas, one of which was dated at  $623 \pm 6$  Ma. East of the IGU, in the Tamaradant domain, metagabbros and meta-anorthosites emplaced within greywackes have geochemical characteristics typical of subduction-related environments (enrichment in LILE and HFSE depletion). A metadiorite intruding the Tamaradant sediments gave an age of  $630 \pm 6$  Ma, which is tentatively taken as evidence for a Pan-African age for the subduction processes that took place east of the IGU. Collision of the Kidal terrane with the eastern margin of the West African Craton is best dated by a syncollisional tonalite, which provides an age of  $604 \pm 5$  Ma. Late kinematic processes shortly followed at  $599 \pm 4$  Ma as exemplified by the emplacement of a monzogranite belonging to the complex Central Batholith. The geochronological and geochemical evidences provided by this study allow proposing that the Kidal terrane, the IGU and Tamaradant domain of the Adrar des Iforas once belonged to a single terrane, which probably extended northward to include the IOGU, and which was later dissected by major lithospheric scale faults during the late Pan-African orogenic phases.



Schematic evolutionary diagram for the Adrar des Iforas during the Neoproterozoic [1].  
 [1] Bosch D., & al. (2016), *Journal of Geodynamics*, 104-130].