The Aït Makhlouf massif (IGherm Inlier, Western Anti-Atlas, Morocco): an example of Late-Pan-African Metamorphic Core Complex

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The Precambrian rocks of Igherm inlier (Western Anti-Atlas) exhibit three main tectonometamorphic units metamorphosed under contrasted conditions. The lower unit, with a Palaeoproterozoic ductile basement (Kerdous Group) and metamorphic rocks ranging from low-grade phyllites to amphibolite facies, intruded by several eburnean granitoids. The Neoproterozoic Cover consists of: i) a brittle-ductile thick layered quartzites and carbonates (Taghdoute Group), intruded by doleritic dyke swarms and sills, and; ii) the uncomfortably overlaying late Neoproterozoic volcanoclastic series of the “Ouarzazate Supergroup”, confined to surrounding basins, filled up by conglomerates and volcanoclastic rocks in an extensional environment context.

Two main successive tectonic events are recognized: i) D1/S1 ductile compressive event associated to NE-SW trending folds and regional foliation, affecting both the lower metamorphic unit and the Quartzite series. It represents the main Pan African shortening event, coeval to that described elsewhere in the Anti-Atlas, ii) D2/S2 brittle-ductile deformation developed during the Late- to post-Pan African extensional event. In the Igherm inlier, it consists of a large-scale low angle normal detachment developed and separates the uplifting lower metamorphic unit from the upper fragile one. Along the detachment fault, the two units were overprinted by the S2 mylonitic foliation. Parallel, high to low angle normal faults induced tilting blocks at the upper unit as well as in the neighbouring sedimentary basins. Such main detachment fault engenders normal stacking characterized by `younger on older’ overlapping structures.

Tectonic features of the Irherm inlier are consistent with the “metamorphic core complex” model, leading to the exhumation of the Palaeoproterozoic dome. This tectonometamorphic example is ongoing to be identified into others surrounding inliers and must subsequently, integrate the Late- to Post-Pan African collapse reconstitution of the Western Anti-Atlas.

Key words: Anti-Atlas / Pan African / Exhumation / dome / Lateorogenic Extension.