

## **Physical Volcanology of the lava flows of the Central Atlantic Magmatic Province (CAMP) of Morocco**

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The CAMP magmatism occurred at about 200 Ma on four continents and preceded the disruption of Pangea and the opening of the Central Atlantic Ocean. In Morocco, the thickest (up to 350m), best preserved and most complete basaltic lava flow sequences of the CAMP are well exposed in the Central High Atlas basin. Four lava flow fields, emplaced in subaerial environment, are recognized and classically designated Lower, Intermediate, Upper and Recurrent Formations. The boundaries between the four formations are marked by sedimentary levels of various lithologies (siltstones, sandstones, stromatolitic limestones) and paleosols that represent minor periods of volcanic inactivity. The CAMP lava Flows of Morocco can be grouped in two major categories: “compound pahoehoe flows” and “simple flows”. The former category is found almost exclusively in the Lower and Intermediate Formations, while the second category dominates the Upper and Recurrent Formations. The larger lobes (and many smaller ones too) that form the compound pahoehoe flows display a characteristic three-tiered structure with a thin “basal lava crust”, a dense “lava core”, and an “upper lava crust”. The former is locally characterised by the presence of “tumuli”, “squeeze up” and horizontal “squeeze” structures. The second category is found exclusively in the Upper and Recurrent Formations. The simple flows appear as simple cooling units, without multiple lobes. Some of them are characterised by “rubbly tops” or “flow-top breccia”. The basaltic lava flows of Moroccan CAMP, particularly the compound pahoehoe flows of the Lower and Intermediate Formations, show excellent and unambiguous evidence of endogenous growth or “inflation”. In this sense they are similar to inflated pahoehoe flows observed in Hawaii, on the basaltic provinces of the Columbia River, and Deccan.