

In Depth Imaging of the new volcano in the East of Mayotte.

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A major seismic crisis began in May 2018 and an active underwater volcano was discovered at 3400m water depth in May 2019, east of Mayotte Island. Although well recognized through multibeam mapping, the volcano has never been imaged at crustal depth until now. The relationship between this recent magmatism and deeper structures remains unknown, raising the question of the geodynamical context during the formation of the Comoros Archipelago. The nature and the age of the crust under and around the Comoros Archipelago is indeed still debated.

The SISMAORE cruise carried out onboard R/V Pourquoi Pas? in early 2021 collected a multichannel seismic dataset in order to image the volcanic zone off Mayotte.

Multichannel seismic data reveal, within the sedimentary cover, strong continuous reflectors that we interpret as a lava flow, marking the top of the volcanic edifice. This lava flow extends as far as 30 km south of the volcano within the Comoros basin. The same lava flow stretches 16 km northwards from the volcano and reaches two nearby ridges known as Les Jumelles. This layer is covered, to the South, by up to 600 meters of sediments onlapping the top of the volcanic edifice. The base of the volcanic edifice is not clearly defined, probably due to the mixing between sediments and melt products. However, we observe that the volcanic edifice sits on a ~2,5-km-thick sedimentary cover. In the crustal part, a strong acoustic basement interpreted as the top of the crust is clearly visible. At places, apparent faults delimit small basins. We notice vertical perturbations in the sediments, revealed by chaotic chimney facies, from the top of the acoustic basement to the base of the volcanic edifice. This observation suggests that the magmatism and older deep crustal structures could be locally linked.

Mots-Clés : Volcano, magmatism, sedimentary cover, deep structures, Mayotte, Comoros basin, seismic reflection.