

GEOLOGIC AND TECTONIC EVOLUTION OF A LACUSTRINE BASIN IN A ARID AREA: LAKE ABHE, SOUTHERN AFAR DEPRESSION

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The arid zones of the Earth are key elements to understand the geological behavior of large-scale sedimentary processes occurring on the Planet. In spite of this capability, the arid zones are still poorly known at large scale. We analyzed the geomorphology, tectonic and sedimentary evolution of Lake Abhe, East Africa, using different remote sensing data (ERS 1-2 and JERS radar, LANDSAT and CORONA) in order to obtain a complete and multitemporal data set of the study area. This work is also part of an European Space Agency project on the sedimentologic and geomorphologic evolution of sedimentary basins of dry land using ERS1-2 radar data. The structural and morphological analysis has been also performed using a high-resolution digital terrain model obtained by radar interferometric technique. Lake Abhe is located in the northern termination of the east African rift system and is very peculiar in terms of tectonic and depositional pattern relationships. The paleodrainage and paleomorphologies show the lake covered an area at least three times bigger in the late Pleistocene; nevertheless, the shorelines of the lake receded of two km in the last fifty years. This rapid variation of the lake level is more consistent with recent tectonic activity that has changed and strongly affected the drainage of the headwater of the lake.