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Stratigraphy and structural setting of the ne sector of el Hierro, Canary Island

Claudia Principe¹, Gianluca Groppelli², Eduardo Oglialoro³

¹IGG-CNR Italy

²IDPA-CNR Italy

³Milano Bicocca University Italy

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New field-based stratigraphic and structural data allowed a subdivision of the oldest sector of El Hierro Island in five activity phases. The stratigraphic succession starts with pillows lavas, characterizing a first submarine phase of activity (Phase A), firstly recognized mainland. The complete emersion of the island is realized at the end of the second phase (Phase B) that comprehends also an intrusive complex. From this moment El Tiñor volcano starts to grow in the central portion of the study area (Phase C). At about 1 Ma a NNE-SSW fault-graben system (San Andrés fault) acts the displacement of the easternmost zone of El Tiñor (Phase D). This caldera depression was subsequently filled and mantled by a thick succession of lava flows (Tamiuca and Caldereta area, and Valverde lava flow). During the last phase of volcanic activity (Phase E) in the entire NE sector a number of tuff and cinder cones and related lava flows occurred, distributed on the flat topography of El Hierro and inside the Tamaduste collapsed area. The phreatomagmatic tuff ring of Ventejis and the phreatic event of La Caldereta are part of this last phase lasted in the Holocene. Four tectonic trends (90°N, 130°N, 30-40°N, and 340°N) switched on and off the activation of the volcanism in this area of El Hierro and controlled the occurrence of building or destructive episodes. There is much evidence that at least the 320-340°N trend is still active. The association of this 320-340°N trend with the 90°N and the 130°N older trends can be responsible, in future, of a detachment of another portion of El Hierro island along the eastern coast, constituting a new gravitational collapse, positioned near to the most populated area of the island, and probably triggering a tsunami that can affect also other Canary Islands.