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Stratigraphy, sedimentology and eruptive mechanism of the El Golfo phreatomagmatic edifice (Lanzarote, Canary Islands)

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The El Golfo tuff cone is an example of phreatomagmatic edifice, developed in the western coast of Lanzarote (Canary Islands). El Golfo, together with other edifices of the same age, is aligned along a fracture oriented NEE-SWW coinciding with the main lineation of the historic volcanism in this part of the island. In this contribution we present a detailed stratigraphic study of the succession of deposits and we interpret them in terms of depositional processes and eruptive dynamics. The eruptive sequence is exclusively represented by a succession of pyroclastic deposits, and we infer it according to variations in flow regime and the magma-water interaction.
Several pyroclastic units were identified according to facies variations based on sedimentary discontinuities, grain size, components, variations in primary laminations and bedforms following the facies model proposed by Chough and Sohn (1990). The growth of the El Golfo tuff cone involved several stages based on variations in depositional processes. The edifice was constructed very rapidly around the vent controlling the amount of water that got access to the eruption conduit. Although the invariable phreatomagmatic character of most of the pyroclastic sequence, it is possible to deduce variations in the explosive energy, with a general increment upwards, according to the increase in the degree of fragmentation of pyroclasts, The absence of hyaloclastites, the nature of the palagonite alteration and the observed sedimentary structures, demonstrate the subaereal character of most of the deposits