



## **Architecture of Las Cañadas stratovolcano in Tenerife inferred from the study of its intrusive complex**

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Building of the Las Cañadas stratovolcano was supplied by intrusive complex consisting of crustal chambers and extensive conduit system. The volcanic complex was modified by episodic vertical subsidence resulting in a collapse caldera. Although landslides destroyed northern sector of the caldera, the upper part of the intrusive system is exposed along the large sector of the scalloped caldera wall and within the Los Roques de García spur, a remnant of pre-caldera rocks situated within it. Intrusions of Las Cañadas complex are mainly phonolitic in composition, 0.5 to 15 m thick, segmented and may be subdivided into three structural types: inclined cone sheets, and subvertical radial and ring dikes. Not only stratigraphy of the erupted units, but also distribution and structural characteristics of the intrusions change in the different sectors of the caldera.

El Cedro, westernmost sector of the caldera is older than 2 Ma and cut by radial dikes trending normal to the rim of the sector. Adjacent Ucanca caldera sector is composed of the deposits ranging in age from 1.48 to 1.07 Ma. Cone sheets are multiple, dipping at 40° to 80° to the NE and trending parallel to the sector rim. Less abundant are radial dikes trending normal to the sector rim. Ring dikes are scarcely distributed and trend parallel to the sector rim. Cross-cutting relationships suggest that cone sheets are earliest developed intrusions. Roques de García sector consists of deposits of the age from 1.44 to 0.65 Ma. Cone sheets dip changes from 20° to 70° with a wide range of orientations and dip directions varied between NW and NE. The majority of radial dikes trend normally to the sector rim and a few exposed ring dikes trend parallel to it. Guajara sector of the caldera composed of the wide-age-range deposits from 3.34 Ma to 0.71 Ma. Two sets of sparse radial dikes developed: older E-W-trending and postdating it N-S-trending. Minor cone sheets dip at 50-70° mainly to NW.

Vents of phonolitic magma conduits associated with proximal welded fallout deposits produced during their eruption are exposed on the upper parts of the Las Cañadas caldera wall. Vents have a wide spectrum of morphologies including cylindrical to ellipsoidal massive plugs with vertical flow foliation at their lateral margins that served as a magma conduits for eruptions; eruption-feeding vent structures consisting of a narrow conduit flaring upward with inward-dipping foliation parallel to the wall-rock contact; and elongated domes with antiformal-shaped flow foliation emplaced from a magmatic fissures during the waning stages of eruptions.

Predominance of the distinct types of intrusions, variation in their distribution and configuration as well as their cross-cutting relationships in different sectors of the caldera indicate formation of at least three distinct magma chambers in the complex of Las Cañadas. Distribution of the eruptive fissures and conduit-vent structures suggests that besides central intrusive system, volcanic complex has developed a number of satellite magma conduits transferring magma to its peripheral parts.