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Morphometry of Pyroclastic Cones and Dykes to Identifying Volcanic Rift Zones: An Example from La Réunion, Indian Ocean

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We describe a methodology useful to identify complex rift zones on recent/active volcanoes, where structures mainly hidden by recent deposits and logistical conditions might prevent from carrying out useful and exhaustive field study. We used georeferenced topographic maps, aerial photos and digital terrain models to perform a statistical analysis of several morphometric quantitative parameters of pyroclastic cones. This provides a great deal of geometric information that can help in distinguishing the localisation and orientation of buried magma-feeding fractures, which constitute the surface expression of rift zones. This also allowed the build-up of a complete GIS database for pyroclastic cones. As an example, we applied this method to La Réunion island, which is a perfect example where past and active volcanic rift zones are mostly expressed by clusters of monogenic centres that hinder the rift fracture fields. These data have been validated in the field and compared and integrated with the distribution and geometry of dyke swarms. Results show the presence of several main and secondary rift segments of different ages, location and orientation, whose origin is discussed in view of regional and local geology.

Planetary Aspects of Volcanism: Insights into the Volcano-Tectonic Relationship on Earth

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There are many alternative definitions of a volcanic system, each focusing on different