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## Gravity changes at Cumbre Vieja, La Palma (Canary Islands), associated with the 2021 eruption.

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The 2021 eruption at the Cumbre Vieja rift (La Palma, Canary Islands) lasted 85 days from September 19th to December 13th, becoming the longest historical eruption in this island. During this period, an elongated fissure eruption built a volcanic cone reaching 1,121 m a.s.l. Lava emerged from six major craters and up to nine minor vents with alternating activity, according to temporal variations in the eruptive process. We conducted several gravity surveys before, during and after this eruption that provided us with valuable spatial-temporal information to study this volcanic event. The obtained Bouguer anomaly map revealed a model of the shallow crustal structures before the eruption, which allowed to study the framework where the volcanic process developed. The analysis of the observed space-time gravity changes suggested a model of the magmatic feeding system, which draws the spatio-temporal path of magma ascent from the crust-mantle boundary to the surface. In addition, we also investigated the differences among the several gravity surveys to infer the possible mass changes that took place during the volcanic process. The interpretation of these gravity changes associated to the 2021 eruption at the Cumbre Vieja rift is supported by the analysis of the spatio-temporal distribution of the earthquake hypocenters preceding the eruption and the ground displacement calculated using GNSS data.

### V01 Volcano Geodesy Techniques and Approaches for Studying and Monitoring Volcanic Processes

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