



## **Recent (2007-2011) unrest episodes at Alcedo (Galàpagos, Ecuador) revealed by InSAR data and numerical models.**

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Despite being the second largest caldera on Isabela Island (Galapagos, Ecuador), Alcedo is the least studied, as no eruption has occurred in the last decades. Nevertheless, Alcedo has been recently and repeatedly characterized by non-eruptive unrest episodes and strong degassing. These unrest episodes are poorly studied and understood. Using InSAR data, we show the complex volcano-tectonic evolution of Alcedo in the last twenty years. We observe that Alcedo underwent an asymmetrical intra-caldera uplift of  $\sim 30$  cm from 2007 to 2009. This deformation event was immediately followed by subsidence of the previously uplifted part, while the NW portion of the caldera underwent uplift. We investigate these patterns of deformation using numerical inversion models. The first deformation event can be explained by the emplacement of a sill and the activation of an intracaldera ring fault. The second event is consistent with lateral, NW-oriented, magma migration from the previously inflated sill, leading to its deflation. This study reveals a lateral shallow magma transfer mechanism similar to what has been observed at other erupting volcanoes in the western Galapagos. However, at Alcedo the lateral transfer of magma is interrupted at an early stage, probably resulting from a discontinuous replenishment of the shallow magma reservoir.