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The challenge of monitoring volcanic unrest processes in small oceanic islands: the case of Tagoro volcano (Canary Islands)

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Monitoring the activity of a volcanic unrest in an archipelago is always a challenging task. Difficulties are even greater if we are also dealing with monogenetic volcanism, without a defined magma chamber, where each unrest can be related to a different magma intrusion, following different ascending paths towards an eruptive vent that can arise both on land or at sea. Moreover, if the repose time between eruptions is long, the historical eruptive record contains very few eruptions, and hence few data that allow an in-depth characterization of the dynamics of the volcanism in the area.

This year marks the tenth anniversary of the beginning of the last eruption in the Canary Islands (submarine eruption of Tagoro volcano, 2011-2012). In this work we review the main difficulties, concerns and uncertainties that arose in the monitoring of this phenomenon. Some of these problems were solved during the crisis, throughout a multiparametric monitoring and the collaboration of different institutions; others would not be a major problem today, thanks to recent technological advances. On the other hand, there are still some unsolved monitoring difficulties when studying an event similar to the one which lead to Tagoro volcano ten years ago. Part of the complexity is inherent to the spatial distribution of the islands in the archipelago and the limitations on the knowledge of the volcanic phenomenon. It is in these last challenges where the key to improve the volcano monitoring in oceanic islands is.