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Characterization of the paricutin lava field: a perfect scenario for lava flow simulations

Patricia Larrea^{1,2}, Laura Becerril³, Sergio Salinas⁴, Elisabeth Widom², Claus Siebe⁵, Joan Marti³

¹School of Geological Sciences and Engineering, YACHAY TECH

²Department of Geology & Environmental Earth Science, Miami University

³Institute of Earth Sciences Jaume Almera, ICTJA-CSIC

⁴Facultad de Ingeniería, UNAM

⁵Departamento de Vulcanología, Instituto de Geofísica, UNAM

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Paricutin is one of the best studied monogenetic volcanoes from the Michoacán-Guanajuato volcanic field located in the Trans-Mexican Volcanic Belt. The eruption started on the 20th of February 1943 and ended 9 years later on the 4th of March 1952, covering a total area of 233 km² with ~1.38 km³ of lava and pyroclastic material [1 and references therein]. Paricutin represents one of the rare occasions when scientists had the opportunity to observe the birth of a new volcano and survey all of the eruptive phases in progress. The existence of detailed lava flow distribution maps defining the 23 eruptive stages [1] makes this volcano an exceptional example to test lava flow simulations tools. The free software VORIS 2.0.1 has been used for this purpose [2]. The software simulates scenarios for different kinds of hazards such as lava flows, PDCs and fallout deposits, contributing to the long-term hazard assessment of volcanic areas in a spatial context. For each of the eruptive stages we have calculated the most probable scenario using as inputs the pre-existing topography of each stage, the maximum lava flow length and the average thickness of the flows. By comparing the past eruptive behavior of the Paricutin volcano with the simulated eruptive scenarios for the respective stage, we can better understand which are the main parameters controlling past eruptions and the limits of these simulations tools. In addition, this work together with the previous geochemical, morphometric and volumetric characterization of the volcano, will provide the first comprehensive integration of a historical eruption with volcanic simulations in order to achieve a better volcanic hazard evaluation. [1] Luhr, J.F. and Simkin, T. (2003). Paricutin. The Volcano Born in a Mexican Cornfield. Geoscience Press. [2] Felpeto et al. (2007). J. Volcanol. Geotherm. Res., 166, 106-116.