



## **Effect of channel morphology on the seismic signals produced by hurricane-induced lahars at Volcán de Colima, Mexico**

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Volcán de Colima is one of the most active volcano in Mexico. The volcano flanks are continuously reshaped by the joint effect of volcanic and torrential processes. Sediment is provided by pyroclastic density currents (PDCs) during phases of explosive activity, while rainfall-induced lahars progressively erode and transport the pyroclastic material downstream. The last explosive phase of the volcano dates from 10 July 2015, when the summit dome of the volcano collapsed producing concentrated PDCs in the Montegrando ravine. Several PDCs filled a 12-m-deep channel in about two days of intense explosive activity. Volcán de Colima is also commonly affected by intense and long-duration tropical rains related to hurricanes that form over the Pacific Ocean. In 2011 and 2015 hurricanes Jova and Patricia, respectively, triggered large lahars along Montegrando ravine. In this work, we present seismic monitoring data of lahars occurred before and after the 2015 PDCs, gathered with a triaxial broadband station located along the ravine. We found that changes in channel morphology have a strong impact on the seismic signal. Data show a very different spectral response on the horizontal and vertical components, with a dramatic change in frequency distribution before and after the 2015 PDC. These results highlight the great potential of seismic techniques to characterize lahar processes.