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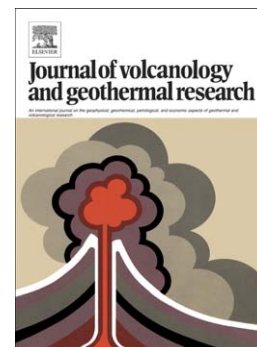
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# Spatio-temporal evolution of rockfall activity from 2007 to 2011 at the Piton de la Fournaise volcano inferred from seismic data.

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## Abstract

Seismic data have been used to catalog the location and volume of most of the rockfalls that occurred at the Piton de la Fournaise volcano from May 2007, just after the major collapse of the Dolomieu summit crater floor, to May 2011. This catalog made it possible to compare the evolution of the number and volume of rockfalls at a high temporal resolution and to investigate their links with eruptions, seismicity, deformations and rainfalls affecting the Piton de la Fournaise volcano. Results show that the purge of unstable areas created by the Dolomieu crater floor collapse occurred in two phases: a first phase, lasting three months, during which the intense rockfall activity immediately following the collapse decreased abruptly and a second phase, lasting more than two years, during which the daily volume of the rockfalls slowly decreased before reaching a steady state. A detailed study of 4 time periods, including 3 eruptive cycles, indicates the strong seismicity can increase the number of rockfalls. Furthermore, when a dike reaches the surface at the summit of the central cone, giving birth to an eruption, the associated local forcing can in some cases increase the volume of rockfalls, possibly by creating or expanding weak zones. In most cases, this is not observed for dike intrusions that do not reach the

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