

## From conduit processes to surface emissions: constraints from seismic and Doppler radar data

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We have investigated the dynamics of volcanic explosive eruptions, from the sub-surface source mechanisms through to the surface emission dynamics. To this end, we carried out a cross-correlation of broadband seismic data and ground-based Doppler radar data (VOLDORAD) recorded at Arenal (Costa Rica). Arenal is a small stratovolcano ca. 1.1 km in height, characterized by a mildly-explosive activity which commonly expels both ash plumes and ballistic projections that can rise up to a few hundred meters above the vent. The radar data inform on the mass loading and velocimetry of the expelled ejecta through time and space, while the seismic data inform on volcanic processes operating within the edifice. A conceptual model is proposed to account for the complex interplay of both data, whereby fractures through a rigid lava cap control the system's degassing, which in turn governs both the seismic and radar signals.

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