Description of Additional Supplementary Files

Name: Supplementary_movie1.mp4
Description: this video presents thermal (top) and visible (bottom) images captured by the ROC and LBZ cameras, respectively, during the onset and progression of PDC1 on 9 October 2022. The ROC thermal camera records at 2 Hz, while the LBZ visible camera operates at 0.5 Hz. The video spans from 07:22:00 to 07:25:00 UTC, covering the entire event. Around 07:22:50 UTC, the detachment of PDC1 is visible, followed by its descent until it reaches the sea at 07:23:30 UTC. The thermal images highlight intense explosive activity and a lava overflow following the onset of PDC1.

Name: Supplementary_movie2.mp4
Description: this video shows thermal (top) and visible (bottom) images recorded by the ROC and LBZ cameras, respectively, during the onset and development of PDC2 on 4 December 2022. The ROC thermal camera operates at 2 Hz, and the LBZ visible camera at 0.5 Hz. The recording covers the period from 15:17:00 to 15:20:30 UTC, capturing the full propagation of PDC2. In the thermal video, we observe the sliding and fragmentation of a ~47-metre-wide, ~35-metre-tall mass that triggered PDC2. The PDC begins at approximately 15:17:50 UTC and reaches the sea at 15:18:24 UTC. The thermal images also show intense degassing following the mass detachment, as well as significant flank instability prior to the event.

Name: Supplementary_movie3.mp4
Description: this video shows 1 hour and 50 minutes of visible images (recorded at one-minute intervals) from the LBZ camera, focused on the SdF volcanic flank between 13:50 and 15:40 UTC on 4 December 2022 (i.e., during PDC2). Signs of flank instability appear at around 14:26:56 UTC. Between this time and the onset of PDC2 (at 15:18:56 UTC), several gravitational flows are observed travelling along the SdF, accompanied by a lava overflow. Following PDC2, the footage reveals a further intensification of flank instability.

Name: Supplementary_movie4.mp4

Description: this video comprises 1 hour of visible images (captured at one-minute intervals) from the LBZ camera, showing the SdF volcanic flank between 07:00 and 08:00 UTC on 9 October 2022, encompassing the PDC1 event. The propagation of PDC1 is visible at 07:23:00 UTC, along with two additional gravitational flows at 07:34:56 and 07:46:57 UTC.