Description of Additional Supplementary Files

File name: Supplementary Movie 1.
Description: This video shows the lava fountaining of 10 February 2022 between 21:25 and 21:30 UTC from the INGV EMCT thermal surveillance camera located at Monte Cagliato (~8.0 km ESE from the vent, 1160 m a.s.l., frame rate 0.5 FPS). The images highlight the ground-hugging cloud starting at 21:26:24, and the hot ash cloud rising above and in front of the PDC. The front of the PDC is then hidden by the presence of Monti Barbagallo.

File name: Supplementary Movie 2.
Description: This video shows the lava fountaining of 10 February 2022 between 21:25 and 21:30 UTC from the INGV EMOT thermal surveillance camera located at La Montagnola cone (~2.4 km SSE from the vent, 2600 m a.s.l., frame rate 1 FPS). It is visible the propagation of the hot PDC descending the south flank of the SEC cone starting from 21:26:18, which climbs above the Monti Barbagallo forming an incandescent hot cloud at the front and above.

File name: Supplementary Movie 3.
Description: This video shows the lava fountaining of 10 February 2022 between 21:25 and 21:30 UTC from the INGV EMOV visible surveillance camera located at La Montagnola cone (~2.4 km SSE from the vent, 2600 m a.s.l., frame rate 1 FPS). An intense coarse-grained tephra fallout is visible on the flanks of the SEC before the generation of the PDC toward the south and of the associated tall ash cloud obscured it for some minutes.

File name: Supplementary Movie 4.
Description: This video shows the lava fountaining of 10 February 2022 between 21:25 and 21:30 UTC from the INGV ENT thermal surveillance camera located at Nicolosi village (~15 km SSE from the vent, 730 m a.s.l., frame rate 0.5 FPS). The distal images allow to see the whole sequence of the PDF generation and the westward shifting of the ash cloud, rising for at least 1 km above the PDC.