

Analysis of AD 79 eruption pyroclastic currents impact on a Roman rustic villa in the Pompeii area

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In AD 79 a catastrophic eruption of Vesuvio, described by Pliny the Younger in two famous letters to the historian Tacito, destroyed Pompei, Herculaneum, Oplontis, Stabiae, and caused many thousand of victims. After some hours of eruption the eruptive column several kilometers high began to collapse with strong air shocks, and destructive avalanches of pyroclastic density currents (PDC) travelled down the volcano's slopes. An archaeological excavation survey performed in the Terzigno area, recently brought to light the ruins of several Roman villas destroyed mainly by these PDCs. An innovative "inverse" structural analysis of damages produced on masonry walls determines the overpressures of PDC which took place; it is shown here that similar overpressures, in a possible future eruption, would ravage a large urbanized area, where at several hundred-thousand people live at the present. The results obtained allow both the PDC risk in possible Vesuvio eruptions and new guidelines for building in the neighbouring zones to better defined.