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THE DECEMBER 2002 VOLCANIC ACTIVITY AT STROMBOLI: FALL AND TSUNAMI DEPOSITS CHARACTERIZATION

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The volcano of Stromboli in the Aeolian Islands (Italy) was known since the Roman age as the "lighthouse" of the Mediterranean Sea, due to its persistent "Strombolian" activity resulting in a summit firelight. During its eruptive history, Stromboli displayed effusive activity and paroxysmal eruptions, too. Lava flows usually flood down the Sciara del Fuoco, a steep depression cutting the NW flank of the cone. Paroxysmals often eject large bombs which can injure the inhabited areas and more rarely form small pyroclastic or debris flows.
On the evening of 28 December 2002, effusive activity began after 17 years from the Crater 1; a lava flow reached in about 30 minutes the sea, going down the Sciara del Fuoco. On 30 December, two landslides interested a wide sector of the Sciara del Fuoco, flowing down into the sea. The first one, at about 1.15 p.m., was smaller than the second event which occurred a few minutes later and caused the detachment towards the sea of a more consistent rock volume. This events generated strong tsunami waves which affected the coastline of most of the Aeolian Islands reaching the Milazzo port, about 50 km far. Up to 10 m high waves caused severe damages to the seaside of Stromboli and to the small buildings located at Ficogrande village.
We sampled the tsunami sand deposits on the beach and within the houses and the ashes emitted before, and after the tsunami event. The deposits have been studied carrying out grain-size, component analysis, morphometric and compositional characterization. The resulting data allowed to investigate magma fragmentation mechanisms and, for the first time in Stromboli, to characterize the deposit correlated to a tsunami event.