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Unusual double plume from a single paroxysmal eruption at Etna : the 26 October 2013 event

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An unusual double volcanic plume rose from summit craters of Mount Etna (Sicily, Italy during the paroxysmal eruption of 26 October 2013. The Northeast Crater, one of several on Etna's summit, was emitting an ash column reaching an altitude of about 1 km, while the New Southeast Crater was simultaneously feeding a lava fountain, which culminates with the formation of a 4 km high sustained ash plume and two fast-moving lava flows. After the end of the last lateral eruption (2008-2009), between January 2011 and December 2013, Mount Etna displayed 46 episodes of lava fountaining, lava flow emission, and tephra columns, which occur at the New Southeast Crater in summit area of the volcano. It is worth to note that only during the 39th episode on 26 October 2013, the lava fountain from New Southeast Crater was coupled to an ash column from the Northeast Crater. Multiple eruption columns are unusual at Etna, as a result of the complex plumbing system within the volcano. Geophysical (gravity, magnetic and volumetric strain signals) and infrared satellite measurements are here presented and discussed to track the temporal evolution of this eruptive event. The multi-disciplinary approach provides insight into the emptying of a shallow storage magma zone inside the volcano edifice and allows us to follow the path of gas-rich magma batches from depth to the Earth's surface, as well as their spreading on the ground surface and in the atmosphere