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In support of a deep fluid trigger for paroxysmal activity at Stromboli

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Paroxysmal activity of Stromboli volcano (Aeolian Islands, South Italy) is characterized by unusually large vulcanian explosions. The 2003, April 5th event has been the most energetic blast ever occurred at Stromboli volcano since 1930. Its high explosive nature is testified by the 1 km-high eruptive column, and the 4 km-high convective plume. Ballistic ejecta reached distances larger than 2 km. We analyze available seismic and geochemical data available for this event and interpret them in terms of release and ascent of a gas slug of deep crustal origin. In particular, important variations in seismic tremor features and anomalous ultra-long period signals provide constraints on pre-explosive timing, while geochemistry of erupted products yields pressure-volume relations and the budget of discharged volatiles. The bulk of these information is then processed within the classical Jaupart and Vergniolle model of foam layer collapse providing a fully consistent framework for the strombolian paroxysm.