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Dynamics of 2004 Mt. Etna effusive eruption as inferred from petrologic monitoring of glass compositions

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Petrologic monitoring has been carried out on volcanics erupted during the ongoing 2004 Mt. Etna effusive eruption. To provide 'quasi-real time' information, we studied the petrography and glass compositions of water-quenched samples with SEM-EDS. We propose that the magma feeding the 2004 activity was already stored in the shallow plumbing system of Mount Etna during the 2000 and 2001 eruptive activity. Here it experienced volatile loss and extensive crystallization with formation of prevailing plagioclase. The occurrence of significant compositional and thermal differences among magmas erupted from 2920-2620 m and 2800-2320 m vents, suggest that the geometry of the storage volume is rather complex and distinct cooling/crystallization conditions may occur. Our data exclude that the eruption was triggered by the uprising of a new magma batch. On the contrary, the onset of the eruption could be controlled by the complex dynamics affecting the eastern flank of the volcano.