



## Sulphur dioxide (SO<sub>2</sub>) emissions during the 2014-15 Fogo eruption, Cape Verde

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A new eruption started at Fogo volcanic island on November 23, 2014, an active stratovolcano, located in the SW of the Cape Verde Archipelago; rising over 6 km from the 4000m deep seafloor to the Pico do Fogo summit at 2829m above sea level (m.a.s.l.). Since settlement in the 15th century, 27 eruptions have been identified through analysis of incomplete written records (Ribeiro, 1960), with average time intervals of 20 yr and average duration of two months. The eruptions were mostly effusive (Hawaiian to Strombolian), with rare occurrences of highly explosive episodes including phreatomagmatic events (Day et al., 1999).

This study reports sulphur dioxide (SO<sub>2</sub>) emission rate variations observed throughout the 2014-15 Fogo eruption, Cape Verde. More than 100 measurements of SO<sub>2</sub> emission rate have been carried out in a daily basis by ITER/INVOLCAN/UNICV/OVCV/SNPC research team since November 28, 2014, five days after the eruption onset, by means of a miniDOAS using the traverse method with a car. The daily deviation obtained of the data is around 15%. Estimated SO<sub>2</sub> emission rates ranged from 12,476 ± 981 to 492 ± 27 tons/day during the 2014-15 Fogo eruption until January 1, 2015. During this first five days of measurements, the observed SO<sub>2</sub> emission rates were high with an average rate of 11,100 tons/day. On December 3, 2014 the SO<sub>2</sub> emission rate dropped to values close to 4,000 tons/day, whereas few days later, on December 10, 2014, an increase to values close to 11,000 tons/day was recorded. Since then, SO<sub>2</sub> emission rate has shown decrease trend to values close to 1,300 tons/day until December 21, 2014. The average of the observed SO<sub>2</sub> emission rate was about 2,000 tons/day from December 21, 2014 to January 1, 2015, without detecting a specific either increasing or decreasing trend of the SO<sub>2</sub> emission rate. The objective of this report is to clarify relations between the SO<sub>2</sub> emission rate and surface eruptive activity during the 2014-15 Fogo eruption.

Day, S. J., Heleno da Silva, S. I. N., and Fonseca, J. F. B. D.: A past giant lateral collapse and present-day flank instability of Fogo, Cape Verde Islands, *J. Volcanol. Geotherm. Res.*, 94, 191–218, 1999.

Ribeiro, O.: A ilha do Fogo e as suas erupções, 12a edição, Memórias, Série Geográfica, *J. Inv. Ultramar*, 1960.