# SO, Emission Time-Series During the Onset of the April 2021 Eruption of La Soufrière, St Vincent, Revealed by TROPOMI

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### Overview

La Soufrière volcano on the island of St. Vincent erupted explosively on 9<sup>th</sup> April 2021 after months of effusive activity, destroying many homes and other infrastructure, though thankfully with no casualties. This eruption injected vast quantities of SO<sub>2</sub> into the atmosphere which was detected daily by the TROPOspheric Monitoring Instrument (TROPOMI). We analyse this data with PlumeTraj, a back-trajectory analysis toolkit, to produce time- and altitude-resolved fluxes, providing insights into the processes of this eruption.



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## Results



Gas emission on 8<sup>th</sup> April was relatively low altitude (3 - 4 km) and low flux (~1 kg·s<sup>-1</sup>).



Main phase of explosions display much higher flux (up to 5000 kg·s<sup>-1</sup>) but with a similar injection altitude (~15 km). This suggests the initial explosion cleared previously degassed magma, with this main phase the eruption of the fresh magma in the main phase

### Conclusion

- Very little SO<sub>2</sub> was emitted prior to the explosive eruption
- eruption, suggesting this was clearing previously degassed magma
- This analysis can be applied in near-real-time, opening the possibility for monitoring ongoing eruptions in the future





Initial explosion injected SO<sub>2</sub> at ~15 km, with a peak flux of ~300 kg·s<sup>-1</sup>. Most gas was emitted in a short time-frame.



The initial explosion was sulphur poor compared to the main