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## **New insights into magmatic processes from integrated satellite observation, trajectory analysis and magma ascent modelling**

**Mike Burton**, Giuseppe La Spina, Catherine Hayer, and Benjamin Esse

University of Manchester, School of Earth, Atmospheric and Environmental Science, Manchester, United Kingdom of Great Britain – England, Scotland, Wales (mike.burton@manchester.ac.uk)

Analysis of TROPOMI data with plume trajectory tools opens the possibility of new insights into volcanic / magmatic processes from two data sources: SO<sub>2</sub> flux time series and plume height time series. In this paper we investigate results from explosive eruptions and attempt to explain the results with a magma ascent conduit model. The combination of plume height and gas flux data with a model of the magma ascent process provides a toolkit which allows us to constrain magma reservoir processes from satellite monitoring data. The combination of modelling and observations opens a new volcanological research frontier, because the TROPOMI sensor has daily global coverage, a high spatial resolution and is sensitive enough to detect many small-medium explosions globally, so that a large inventory of explosive activity can be characterised.