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Satellite observations of the volcanic plume from the 23rd April 2015 eruption of Calbuco volcano

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Calbuco volcano, Chile, erupted on 23rd April 2015, producing an eruption column reported to reach 17 km. The eruption was captured on the IASI NRT website (http://www.nrt-atmos.cems.rl.ac.uk/). The data were then reprocessed using the iterative optimal estimation retrieval developed by the EODG group at University of Oxford to determine the SO_2 atmospheric loading and the altitude of the plume over time. The atmospheric loading was measured as 0.3 – 0.4 Tg of SO_2 over the first 2 days. It is thought that the eruption was relatively ash poor, with the majority of the ash falling out within the first couple of days. The retrieved altitude of the plume is consistent with the range initially reported, with the core of the plume reaching 15 – 18 km.
When the SO_2 plume reached the west coast of South Africa, it was caught in a cyclonic system, causing it to remain in the same region for several days with a highly constrained core. A SO_2 depletion rate and conversion time to H2SO4 are calculated from this data.
The data from the IASI instruments are compared to CALIOP lidar overpasses as well as data from the MLS & OSIRIS instruments. The HYSPLIT trajectory model is used to investigate the evolution of the plume and to corroborate the altitudes retrieved by IASI.