

EGU2020-5653

<https://doi.org/10.5194/egusphere-egu2020-5653>

EGU General Assembly 2020

© Author(s) 2020. This work is distributed under the Creative Commons Attribution 4.0 License.



Lidar observations of volcanic aerosol over the UK since June 2019

Geraint Vaughan, David Wareing, and Hugo Ricketts

National Centre for Atmospheric Science, University of Manchester, Manchester, UK (geraint.vaughan@ncas.ac.uk)

On 22 June 2019, the Raikoke volcano in the Kuril Islands erupted, sending a plume of ash and sulphur dioxide into the stratosphere. A Raman lidar system at Capel Dewi, UK (52.4°N, 4.1°W) has been used to measure the extent and optical depth of the stratospheric aerosol layer following the eruption. The lidar was modified to give it much enhanced sensitivity in the elastic channel, allowing measurements up to 25 km, but the Raman channel is only sensitive to the troposphere. Therefore, backscatter ratio profiles were derived by comparison with aerosol-free profiles derived from nearby radiosondes, corrected for aerosol extinction. Small amounts of stratospheric aerosol were measured prior to the arrival of the volcanic cloud, probably from pyroconvection over Canada. Volcanic ash began to arrive as a thin layer at 14 km late on 3 July, extending over the following month to fill the stratosphere below around 19 km. Aerosol optical depths reached around 0.03 by mid-August and continued at this level for the remainder of the year. The location of peak backscatter varied considerably but was generally around 15 km. However, on one notable occasion on August 25, a layer around 300 m thick with peak lidar backscatter ratio around 1.5 was observed as high as 21 km.