

Supplementary material for “Transient ice ring observed during the 15 January 2022 eruption of Hunga volcano”

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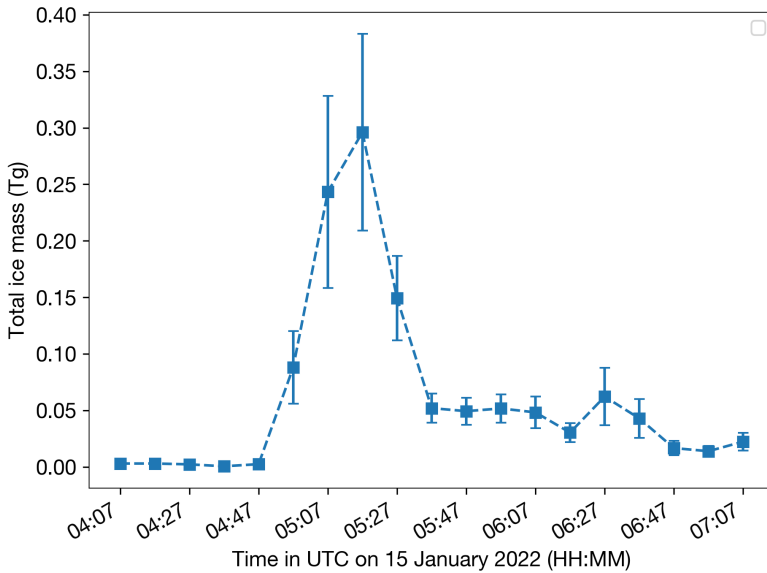
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Supplementary Movie 1

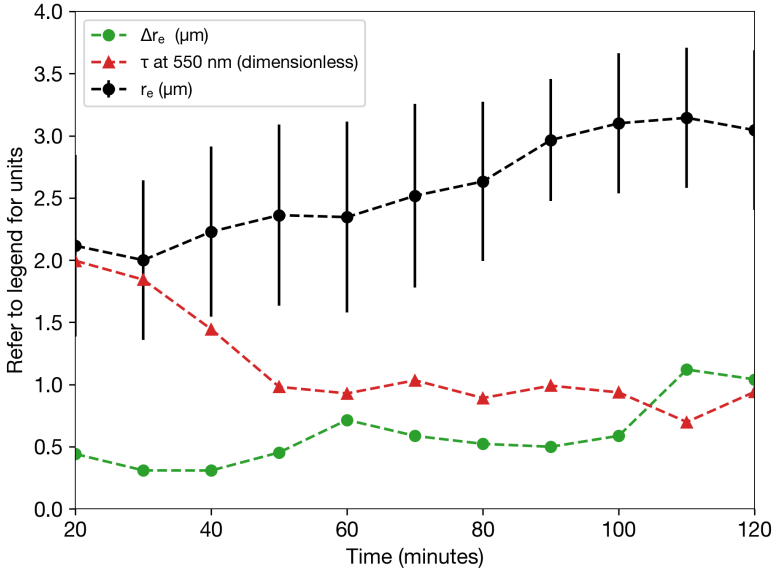
This movie shows the 8.6 - 11 μm brightness temperature difference for all available 10-minute Himawari-8 data from 15:17 UTC on 13 January 2022 to 06:07 UTC on 15 January 2022. Hunga volcano is indicated as a red triangle. Note that times annotated on the movie are nominal Himawari times but the actual observation time at the location of Hunga has an offset of ~ 7 minutes from the nominal scan time (e.g. 15:00 UTC is actually closer to 15:07 UTC).

Supplementary Movie 2

This movie shows an animation of the data presented in Fig. 1 of the main text from 04:07 UTC to 07:07 UTC on 15 January 2022 (see Fig. 1 caption for details).



Supplementary Figure 1 Total ice mass time series calculated from the ORAC satellite retrievals. Note that the total ice mass timeseries shown here includes any retrieval with an 8.6 - 11 μm brightness temperature difference greater than or equal to 15 K and is different to the ‘ice-ring region’ referred to in the main text (i.e. the annulus between 250–300 km centred on the volcano).



Supplementary Figure 2 Time series of ORAC satellite retrievals in the ice ring region (refer to main text for how this is defined). Here r_e and error bars refer to the mean effective radius and standard deviation, respectively (as in Fig. 5 of the main manuscript), Δr_e is the mean absolute uncertainty derived from the optimal estimation algorithm which provides uncertainties on a per-pixel basis and τ is the mean optical depth at 550 nm. The time is calculated in minutes relative to 04:47 UTC on 15 January 2022.