

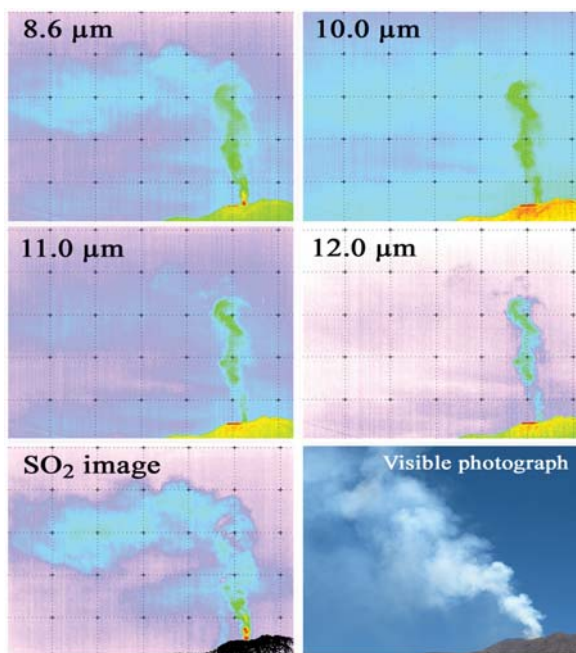
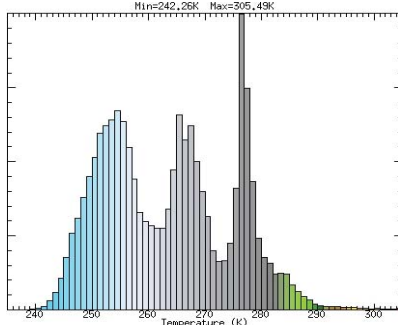
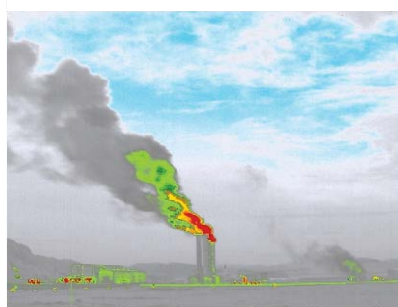
NicAIR

Infrared Multispectral Imaging Camera



NicAIR is a multispectral infrared imaging camera designed for portable, field use at volcanoes and industrial settings. The system is capable of detecting and quantifying SO_2 gas and particulates and can sample at frequencies up to 1 Hz. The camera measures thermal radiation emitted and absorbed by gases and particles in plumes and clouds, and by using specialised software, the captured images can be transformed into column abundances of SO_2 or particulate mass loadings (in gm^{-2}). Feature tracking in the plume makes it possible to measure fluxes.

NicAIR has been tested at several erupting volcanoes including Stromboli and Etna, in Sicily, Tavurvur in Papua New Guinea and Anatahan in the Northern Mariana Islands. It has also been used at industrial plants to measure gases, including industrial plumes from a thermal plant in Iceland. Measurements like these can assess the emission rates of gases and help to mitigate adverse effects on the environment and on health.



Left-panels. Temperature image of a thermal power plant plume in Iceland and the corresponding temperature histogram (bottom left). *Centre panel.* NicAIR mounted on tripod. *Right panels.* Filtered infrared temperature images (top four panels); derived SO_2 image (bottom left) and corresponding digital camera photograph of Turrialba, Costa Rica, volcanic emissions.

Technical Specifications

Total field-of-view	23 - 43°
Optics	um25 mm F1.4 Ge lens
Image Size	640 x 512 pixels
Number of filters	up to 4
Filter 1 (SO ₂)	8.6 µm
Filter 2 (Plume temperature)	10.0 µm
Filter 3 (Ash)	11.0 µm
Filter 4 (Ash)	12.0 µm
Sampling rate (max)	~7 Hz
Detector	Uncooled microbolometer
NEΔT Filter 1	500 mK @ 250 K
NEΔT Filter 2	200 mK @ 250 K
NEΔT Filter 3	200 mK @ 250 K
NEΔT Filter 4	200 mK @ 250 K
Power requirements	12 V, 3 A, 40 W peak
Accuracy (SO ₂)	± 0.2 g m ⁻²
Accuracy (Silicate particles)	± 0.5 g m ⁻²
Detection range	~10 km
Operating temperature range	-10 OC to +50 OC
Weight	8 kg
Dimensions	160 mm x 320 mm x 420 mm (LxWxH) without lens

For silicate particles in the range of 1-16 µm radius.

Contact Details

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