Geophysical Research Abstracts
Vol. 20, EGU2018-14959, 2018
EGU General Assembly 2018

Ash Plume Top Height Estimation using SLSTR

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A stereoscopic plume top height retrieval algorithm based on the Sea and Land Surface Temperature Radiometer (SLSTR) satellite instrument data has been implemented. The method is based on stereo-viewing capability of SLSTR and on an area-based correlation method approach. It provides height estimates for each satellite pixel with nominal vertical resolution of 500 m for the visible channels and 1 000 m for the thermal infrared channels. Combined with an ash detection scheme employing the brightness temperature difference between the 11 μm and 12 μm channels, the algorithm is capable of providing information on both vertical and horizontal extent of volcanic ash plumes. The algorithm can be used in a similar manner for detection of desert dust plumes as well. The SLSTR instrument, orbiting aboard Sentinel-3A since 2016, provides a unique combination of dual-view capability and a wavelength range from visible to thermal infrared which makes it a pertinent instrument for this work. The current work is being carried out as part of the H2020 project EUNADICS-AV (European Natural Disaster Coordination and Information System for Aviation).