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Two powerful Google Earth Engine (GEE) Apps for the worldwide high-temperature features monitoring and investigation

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Two innovative and powerful Google Earth Engine (GEE) Apps have recently been developed to identify and map volcanic thermal features and investigate gas flaring sources at global scale in daylight conditions. Both the GEE Apps are based on the Normalized Hotspot Indices (NHI; Marchese et al., 2019), which analyze the Near Infrared (NIR) and Short-Wave Infrared (SWIR) radiances from the Multispectral Instrument (MSI) and the Operational Land Imager (OLI/OLI-2) sensors, respectively aboard the Sentinel-2 and Landsat 8/9 satellites, to detect high-temperature features. The NHI tool enables the analysis of volcanic thermal anomalies through plots of hotspot pixel number, total SWIR radiance and total hotspot area. In addition, an automated module of the tool notifies the active volcanoes over the past 48 hours (https://sites.google.com/view/nhi-tool/home-page). DAFI (Daytime Approach for gas Flaring Investigation) by performing a multitemporal analysis of the NHI identifies the gas flares on annual basis both onshore and offshore, providing information about the gas flaring sources in terms of persistence of thermal activity and through the computation of the radiative power (https://sites.google.com/view/flaringsitesinventory). These systems demonstrate the relevance of the GEE platform in supporting the analysis, monitoring and characterization of hot targets (both natural and industrial ones) thanks to the massive computational resources and the availability of extended datasets of multisource satellite observations.