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Evaluation of the SIGRI forest fires monitoring system based on MSG/SEVIRI images

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In principle, the remote sensing sensors on board of geostationary satellite, as consequence of the high frequency of the observations, allow the monitoring of these phenomena characterized by a fast dynamics. A constraint for this monitoring is that the events should be enough strong to be recognizable notwithstanding the low spatial resolution of the present geostationary systems (MSG/SEVIRI, GOES Imager, MTSAT).
Apart from meteorological phenomena other events, like those associated with forest fires and/or volcanic eruption, are characterized by a very fast dynamics. These events are also associated with a very strong signal that makes them observable by geostationary satellite in a quasi-continuous way.
However, in order to make possible the detection of small fires by using the low resolution multi-spectral imagery provided by geostationary sensor like SEVIRI (3x3 km2 at the equator) the SFIDE (System for Fire Detection) algorithm, capable to exploit its high observation frequency, has been developed.
This algorithm will be used in the SIGRI (Integrated System for Fire Risk Management) pilot project. This project, funded by ASI (the Italian Space Agency) in the mainframe of the program “Civil Protection from forest fires”, should take into account the institutional requirements, as: the normative aspects in forest fires matter, the distribution of responsibilities and competence of the authorities involved in the following activities: planning and management of the land, dangerousness forecast and risk assessment, prompt fire detection, monitoring and management of the fire event, damage assessment.
The principal user (reference user) of such a system would be the Italian Dept. of the Civil Protection (DPC). Nevertheless, the system would be able to generate information useful for supporting different user types having the role of responding, operationally, to the forest fire management according with the guideline and operational addresses indicated by DPC.
In particular, the objective of SIGRI is the development of products which can be useful to the firefighting activities along all the phases which can be distinguished in the fire contrasting activity: forecast, monitoring/detection, counteract/propagation prediction, damage assessment/recover.
The products to be generated for the tactical phase of the forest fires fighting are characterized by the high frequency of the updating and will provide support to the activity of detection and monitoring of the burning events. For this reason the fire detection is based on the geostationary sensor SEVIRI on board of the MSG satellite. The hot spot detection is performed by using the SFIDE algorithm.
This paper is devoted to show the performances of such algorithm. To achieve this objective the hot spots detected, by applying the SFIDE algorithm to the SEVIRI images, on three selected regions (Calabria, Sardinia and Liguria) will be compared with the ground data, of the last four years, provided by the Italian DPC.