

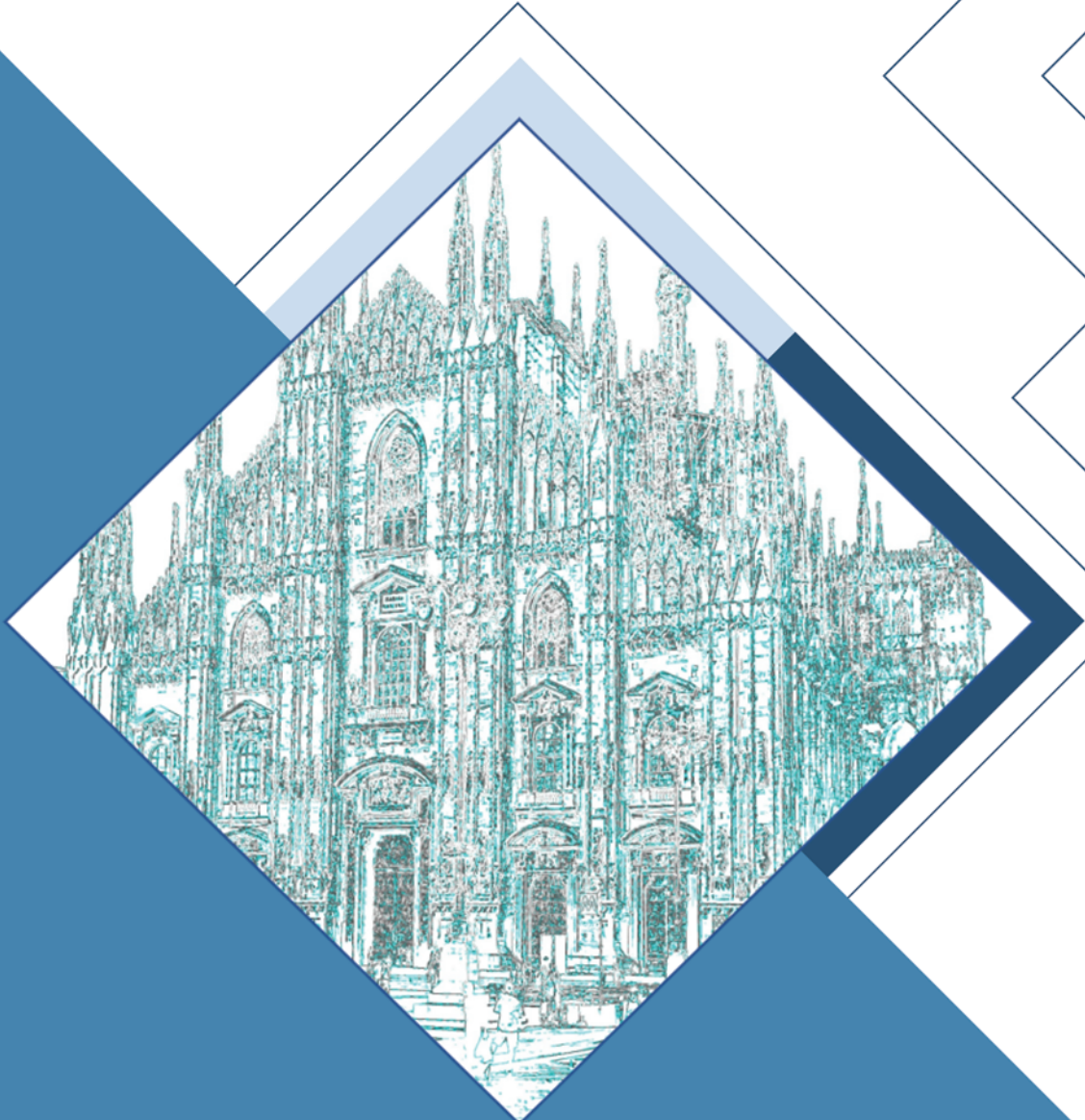


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*Smart Earth Observation
for a Sustainable Future*

ABSTRACT BOOK

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Towards an early fire detection by means of geostationary satellite data and methods

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Wildfires are a worldwide phenomenon with local and global effects. Each year, fires destroy millions of hectares of forests around the world, representing one of the major emergencies which are significantly increasing, both in number and intensity, because of climate change. They may pose a risk for life and infrastructures, degrading air quality and perturbing large areas over a wide variety of biomes. Many satellite-based methods for fire detection and monitoring have been developed to provide systematic and accurate information about fire locations and space-time evolutions. To detect and monitoring short-living events or fires characterized by very rapid evolution times, geostationary satellites must be used, offering a very high observation frequency, i.e., a temporal resolution of 30 up to 5 minutes.

Among the number of fire detection techniques based on this technology, the RST-FIRES, a change detection multi-temporal approach, has already demonstrated a significant improvement in terms of small/starting fire detection using EUMETSAT Meteosat Second Generation (MSG) SEVIRI data with 15 minutes (0deg) of temporal resolution. The RST-FIRES portability on the MSG-SEVIRI Rapid Scan Service (RSS) data, offering 5 minutes of revisit time, has been preliminary experimented. The impact in early fire detection has been assessed and quantified, also comparing with the results of the RST-FIRES implemented on SEVIRI 0deg data, using the official dataset of the Calabria Region (Southern Italy) for the events occurred during July 2022. Results obtained suggest that RSS data could allow for a quite systematic earlier detection and a better sensitivity than MSG 0deg data because of the improved temporal (and spatial) resolutions. These findings are remarkable in view of Meteosat Third Generation/Flexible Combined Imager (MTG-FCI) sensor, missing multi-year time series, to exploit its improved spatial (1, 2 km) and temporal (10 minutes) characteristics as well as a more suitable dynamic range for high temperature sources in the MIR region (saturation at ~ 450 K @3.8 micron).

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