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Rapid detection of flooded areas after Tohoku March 2011 tsunami

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In the recent years there has been a continuous increase of natural disasters affecting the world. Their catastrophic consequences generally have extreme impacts both from an economic and social point of view. The effects are the more severe the higher are the population density and concentration of industrial facilities and infrastructures in disaster-affected areas. Systems able to provide timely information about the affected areas may help in supporting decision makers to manage the crisis. In this context, satellite data may give a useful and effectively support.
The devastating earthquake occurred on March 11, 2011 off the Japan coasts produced a huge tsunami which strongly affected the municipality of Miyagi, where more than two millions of inhabitants were used to live.
In this paper, the Robust Satellite Techniques (RST) approach was used to detect areas affected by the flood due to such a tsunami. RST have been already applied with satisfactory results for the detection and monitoring of flooded area by using data acquired both from polar (NOAA-AVHRR and EOS-MODIS) and geostationary (MSG-SEVIRI) system. The potential of such data acquired in the visible and infrared regions of the electromagnetic spectrum has already been verified, allowing the development of an all-day detection and monitoring system of flooded areas.
In particular, the potential of RST when implemented on optical data acquired by the Japan geostationary MT-SAT series satellites for rapid detection of flooded areas within Sendai district will be investigated in this study. MT-SAT, guaranteeing a temporal resolution of 30 minutes and a spatial resolution of up to 1km in the visible channel, together with the high sensitivity to detecting changes, offered by RST approach, should assure the capability for a prompt and effective detection, allowing for a near real time identification of the dynamics and the evolution of the disaster. Results and main achievements of this study will be presented in this paper. Finally, open scientific issues and future perspectives will be discussed.