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Assessing and validating RST-FIRES on MSG-SEVIRI data by means a Total Validation Approach (TVA).

Carolina Filizzola (1), Rosita Corrado (2), Francesco Marchese (1), Giuseppe Mazzeo (1), Rossana Paciello (1), Nicola Pergola (1), Valerio Tramutoli (2,1)

(1) National Research Council, Institute of Methodologies of Environmental Analysis, C. da S. Loja, 85050 Tito Scalo (Pz)-Italy, carolina.filizzola@imaa.cnr.it, (2) University of Basilicata, School of Engineering, Via dell'Ateneo Lucano 10, 85100 Potenza

Several fire detection methods have been developed through the years for detecting forest fires from space. These algorithms (which may be grouped in single channel, multichannel and contextual algorithms) are generally based on the use of fixed thresholds that, being intrinsically exposed to false alarm proliferation, are often used in a conservative way. As a consequence, most of satellite-based algorithms for fire detection show low sensitivity resulting not suitable in operational contexts. In this work, the RST-FIRES algorithm, which is based on an original multi-temporal scheme of satellite data analysis (RST-Robust Satellite Techniques), is presented. The implementation of RST-FIRES on data provided by Spinning Enhanced Visible and InfraRed Imager (SEVIRI) onboard Meteosat Second Generation (MSG) that, offering the best revisit time (i.e. 15 minutes), can be successfully used for detecting fires at early stage, is described here. Moreover, results of a Total Validation Approach (TVA) experimented both in Northern and Southern Italy, in collaboration with local and regional civil protection agencies, are also reported. In particular, TVA allowed us to assess RST-FIRES detections by means of ground check and aerial surveys, demonstrating the good performances offered by RST-FIRES using MSG-SEVIRI data. Indeed, this algorithm was capable of detecting several fires that for their features (e.g., small size, short time duration) would not have appeared in the official reports, highlighting a significant improvement in terms of sensitivity in comparison with other established satellite-based fire detection techniques still preserving a high confidence level of detection.