CGMS

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Prepared by EUMETSAT
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Discussed in WG II

REAL TIME FIRE MONITORING DATA FROM EUMETSAT

In response to CGMS recommendation 33.06

In summer 2005 EUMETSAT developed an operational fire detection module, which has since then undergone several improvements.

The algorithm mainly uses the MSG SEVIRI 3.9 μm channel for determination whether in an image pixel a very warm target (fire) is most certainly or potentially present.

REAL TIME FIRE MONITORING DATA FROM EUMETSAT

1 INTRODUCTION

This document presents a short description of the operational Fire Detection Algorithm (FIR) developed by EUMETSAT to allow for a timely detection of fires or potential fires in the Meteosat field of view.

The product is derived every 15 minutes and is currently available for download from a EUMETSAT FTP server. Within the next three month it will also be made available via the EUMETCast dissemination and the EUMETSAT Web site.

This product will also contribute to the GEO task DI-06-03 for implementation of a fire warning system at global levels, as outlined in the GEO workplan 2007 to 2009.

2 THE OPERATIONAL FIRE DETECTION PRODUCT (FIR)

The main Meteosat Second Generation (MSG) instrument SEVIRI (Spinning Enhanced Visible and Infrared Imager) includes those spectral channels that are commonly used to retrieve fire information from remote sensing data. A further added value of the MSG satellite is its 15 minute repeat cycle, which offers unique opportunities for global hazard monitoring.

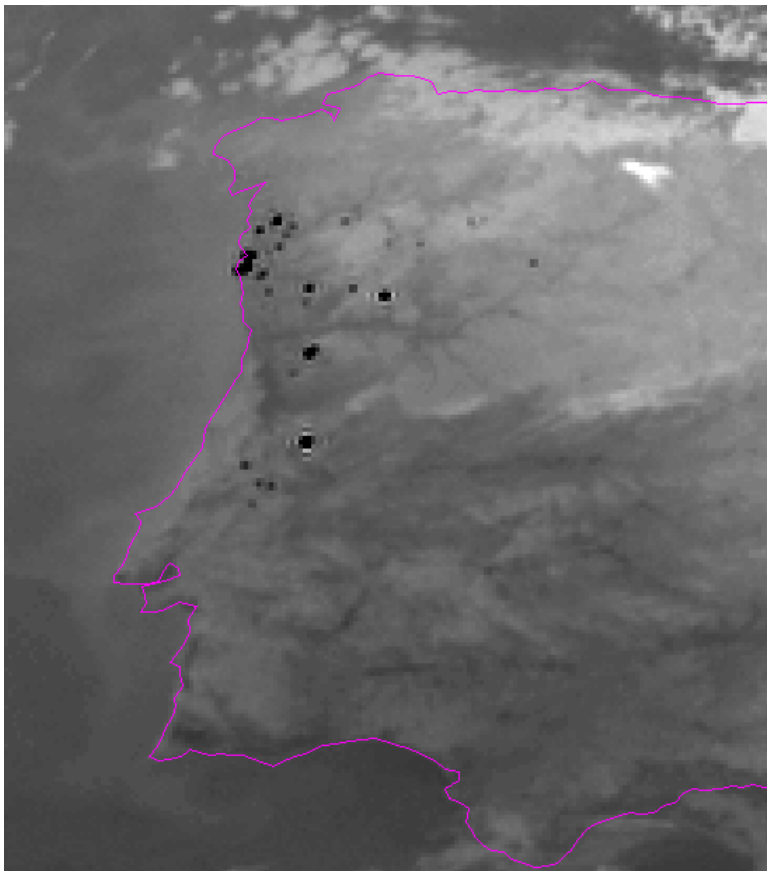

Figure 1 Example of fires as observed as dark (hot) spots in the Meteosat-8 3.9 µm channel on 21 August 2005, 0200 UTC in Portugal

The underlying concept of the algorithm takes advantage of the fact that the SEVIRI channel centred at 3.9 µm is very sensitive to 'hot spots' which are caused by fires within an image pixel. In addition to the 3.9 µm brightness temperature, the fire detection algorithm uses the brightness temperature of the infrared window channel at 10.8 µm and the local standard deviations of these two channels. Active fires are identified if all applied temperature tests exceed certain thresholds, if only some of the tests indicate a fire, the processed pixel is classified as a potential fire. Potential fire pixels may denote pixels with small fires, fires that are already burnt out but have still left a hot surface, or even some false classifications, which could be caused by other hot surfaces, pixels in regions with inhomogeneous surfaces, or pixels with undetected small clouds.

In Europe these fires occur mainly during summer and early autumn. In Africa, however, one can find them throughout the whole year.

3 OPERATIONAL DISTRIBUTION

The FIR product is currently available from the EUMETSAT FTP server at:

ftp://ftp.eumetsat.int/pub/OPS/out/simon/FIRE/

in GRIB2 coded form, using the NCEP encoding software. In addition the results of the operational processing are also available as ACSII files for easy processing.

Around end of October 2006 these results will also be included on the EUMETCast dissemination system for real time distribution.

Furthermore before end of 2006 a graphical representation of the processing results will be found on the EUMETSAT Web site under the sub-category **Derived Imagery Products** (www.eumetsat.int: Home – Image Gallery – Derived Imager Products) for quick visual inspection of areas with active and potentially active fires.

4 CONCLUSIONS

An operational fire detection product in support of global hazard management is distributed by EUMETSAT since October 2005. After several algorithm enhancements the distribution will be further improved by adding this product to the EUMETCast dissemination schedule by end of October 2006. In addition a visualisation of that product will also be available on the EUMETSAT Web site before end of 2006.