Geophysical Research Abstracts
Vol. 13, EGU2011-14158-1, 2011
EGU General Assembly 2011

High Resolution Active Fire Monitoring for Global Change Analysis by FireBIRD

Gernot Ruecker (1), Dieter Oertel (2), Eckehard Lorenz (3), Winfired Halle (3), Thomas Terzibaschian (3), Anja Hoffmann (4), and Joachim Tiemann (1)

(1) ZEBRIS GbR, Lipowskystr. 26, D-81373 Munich, Germany, (2) Astro- und Feinwerktechnik Adlershof GmbH, Albert-Einstein-Str. 12, D-12489 Berlin, Germany, (3) Deutsches Zentrum für Luft- und Raumfahrt, Rutherfordstr. 2, D-12489 Berlin, Germany, (4) Consultant, Uhlandstr. 15, D- 74889 Sinsheim, Germany

An increasing vulnerability of humans to wildfires and a fatal interference of them with civil infrastructure have been noted world-wide. Space-borne detection and monitoring of active fires on Earth surface has been undertaken for more than two decades, however, mainly with meteorological satellite sensors. These sensors provide data with coarse spatial resolution only and they suffer from saturation effects during observation of major wildfires. The data of these sensors only marginally meet the requirements defined by the Global Climate Observation System (GCOS) and the Committee on Earth Observation Satellites (CEOS).
The Bi-spectral InfraRed Detection (BIRD) satellite was launched in 2001 in a demonstrator mission for dedicated wildfire remote sensing by infrared push broom scanner technology on a small satellite with a total mass < 100 kg. BIRD was able to detect and characterize small fires that were missed by other sensors such as MODIS or Meteosat SEVIRI and could characterize large fires without suffering from saturation problems such as the Envisat AATSR instrument.
Small, smouldering and cool fires, often characterizing peatland and tropical small scale agriculture fires, may contribute significantly to global emissions of several trace gases and aerosols.
The upcoming German FireBIRD mission will consist of two satellites: TET-1 and BIROS to be launched in early 2011 and 2013, respectively. Both satellites will carry fire-adapted InfraRed (IR) sensors similar to the BIRD sensors. Based on the BIRD-experience, the two new satellite IR sensor systems feature innovative concepts such as near real time on-board processing of fire data.
The present paper highlights potential applications of FireBIRD for estimating trace gas and particulate matter emissions from wildland fires through analysis of fire characteristics such as Fire Radiative Temperature (FRP) and for studying fire behaviour.
FireBIRD will pave the way for a dedicated and operational Fire Monitoring Constellation (FMC) based on small satellites.