

## **STATUS OF THE CURRENT ESA EARTH OBSERVATION MISSIONS**

CGMS is informed of the status of the current European Space Agency Earth Observation missions. Two of them, MSG and Metop are in co-operation with EUMETSAT. The second ERS satellite, launched in 1995, is currently in limited LBR operations. Envisat and MSG-1 were successfully launched in 1<sup>st</sup> March and 29<sup>th</sup> September 2002, respectively. PROBA is covering the Science mission during 2003.

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## **STATUS OF THE CURRENT ESA EARTH OBSERVATION MISSIONS**

### **1. - INTRODUCTION**

The Earth Observation Directorate of the European Space Agency (ESA) is currently running a number of programmes. Two of these, MSG and Metop are in co-operation with EUMETSAT. The second ERS satellite, launched in 1995, is currently in limited LBR operations. Envisat and MSG-1 were successfully launched in 1<sup>st</sup> March and 29<sup>th</sup> September 2002, respectively. PROBA is covering the Science mission during 2003.

### **2. - STATUS OF THE ERS MISSIONS**

The ERS-1 spacecraft, which ceased its operations in March 2000, is regularly tracked to predict and avoid possible interference with the orbits of other missions. All ERS services are provided by ERS-2, which remains operational. All LBR instruments were operated on a global basis until the 22 June 2003, where the failure of the onboard recorders discontinued the global LR observations of the ERS missions. Since then the ERS-2 Low Rate mission is continued within the visibility of ESA ground stations over Europe, North Atlantic, the Arctic and western North America with the intention in the near future to extend the coverage of Real Time Low Rate acquisition over the North Atlantic. Due to a reduced pointing accuracy caused by the gyro failures, the Wind Scatterometer data distribution was interrupted from 17<sup>th</sup> January 2001 to the 21 August 2003; it is back into operations since 22 August 2003. Currently all LBR data with the exception of ATSR HR data are distributed nominally. SAR is operated in response to user requests with an average duty cycle of some 4 minutes per orbit.

The Platform, Payload and the Instrument Data Handling and Transmission (IDHT) system, beside the recorders, are working nominally and despite the advanced mission lifetime no significant aging has been observed

The most complete information about the ERS mission, system, instruments, its products, user services and latest news can be found at <http://earth.esa.int/ers/>

### **3. - STATUS OF THE ENVISAT PROGRAM**

The ENVISAT satellite was successfully launched on 1st March 2002 by an Ariane-5 vehicle and is since then orbiting in its assigned 35-day repeat cycle, 30 minutes ahead of the ESA ERS-2 satellite.

During the first weeks of the mission, all ENVISAT instruments were progressively switched on and data taking activated successfully for all of them. The Calibration Review in September 2002 established that the spacecraft and all instruments were operating nominally, with very stable performances observed from all of them. The Validation Workshop in December 2002 confirmed the enthusiasm of the Earth Science community for the initial performances and capabilities of the data provided by the 10 ENVISAT instruments.

The services to users were gradually open from early 2003, a large part of the 48 types of products being now available to the scientific user community. Two Distributing Entities ensure the commercial availability of ENVISAT data. The validation effort will continue during the mission lifetime in order to improve the accuracy of the product geophysical measurements

The most complete information about the Envisat mission, system, instruments, its products, user services and latest news can be find at <http://envisat.esa.int/>

## **4 – CHRIS on PROBA**

### **4.1 Introduction**

ESA's small satellite platform PROBA (Project for On-Board Autonomy) is an agile technologically advanced platform of the 100 kg class developed by ESA and built by Verhaert. The principal payload is the Compact High Resolution Imaging Spectrometer (CHRIS) built by Sira Electro-Optics Ltd. The payload was selected through the announcement of opportunity (AO) procedure. The development and commissioning of the CHRIS instrument was funded by BNSC. Other instruments on-board PROBA include a radiation measurement sensor (SREM), a debris measurement sensor (DEBIE), high resolution and wide angle Earth pointing cameras, a star tracker and gyroscopes.

### **4.2 The CHRIS Science mission**

In combination with the PROBA platform, the CHRIS instrument provides images with high spectral and spatial resolutions as well as directional capabilities. CHRIS has spectral coverage from 400 to 1050nm with a minimum spectral sampling interval ranging between 1.25 and 11nm and up to 62 bands. The ground sampling interval of 17 m at nadir. Directional data sets useful for the study of BRDF properties are acquired through the along track and across track pointing capabilities of the PROBA platform. Standard image sets delivered to Principal Investigators (PIs) include 5 separate images collected at -55, -30, 0, +30 and +55 degrees along track and a variable across track pointing angle.

Following an AO procedure 61 PIs have been selected for scientific experiments. Furthermore ESA has funded in 2003 a programme of work for the operation of the data processing facility and the provision of hyperspectral multi-angular image data sets on selected test sites to the scientific community. A first workshop focused on CHRIS/Proba was held in April 2003, in ESTEC, with over 50 participants.

### **4.3 The CHRIS status**

Currently (August 2003) the CHRIS instrument and associated processing chain are providing high spatial and spectral resolution directional data sets for atmospheric, land and coastal studies. The ESA Kiruna station has routinely been acquiring images since June 2003 in addition to the Redu station downlinks. This has led to increased coverage and doubled the output of images to approximately 60 images/month. Plans for the permanent archiving of data at ESRIN are being developed and the archiving is expected to start in October 2003. The science program has been augmented through a dedicated field experiment in support of SPECTRA Phase-A. An extensive field measurement program involving 10 different

European institutions, 40 scientists and including soil, vegetation and atmospheric measurements was carried out co-incidentally with CHRIS acquisitions in July 2003.

In programmatic terms the instrument continues to perform to the full satisfaction of the Earth Observation science community. The performance of the CHRIS instrument in particular, and the PROBA platform as a whole indicate that further exploitation of the platform and EO instruments is desirable. Funding for the continued exploitation of the CHRIS/PROBA instrument beyond November 2003 is being sought.

#### **4.4 CHRIS data access**

The instrument acquisition and processing are planned in principle according with the requirements of the approved mission experiments. The archived data are also accessible to other interested scientists.

#### **4.5 Links**

<http://www.rsac1.co.uk/chris/mission/index.htm>

<http://www.chris-proba.org.uk/frames/index2.html>.

<http://www.estec.esa.nl/wawww/ES/PROBA.html>

[http://www.esa.int/export/esaSA/SEM6NFYO4HD\\_earth\\_0.html](http://www.esa.int/export/esaSA/SEM6NFYO4HD_earth_0.html)

### **5 - REFERENCES**

Further information about the various ESA missions can be found on the following WWW addresses which offers the possibility to download many supporting relevant documentation:

<http://www.esa.int>

<http://envisat.esa.int>