Brockmann Consult

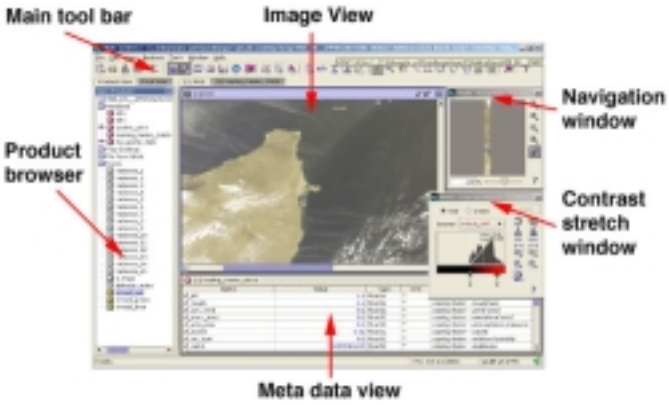
Environmental Informatics • Scientific Consulting

Product Information

BEAM

- The Basic Envisat and ERS (A)ATSR and MERIS Toolbox -

BEAM is an application suite which facilitates the utilisation, viewing and processing of the Envisat MERIS, AATSR and ASAR data products as well as ERS-ATSR and MODIS products. BEAM has become the definitive, freely available software used throughout the Envisat scientific user community. Thanks to its 100% pure Java implementation, it is available for the Windows, Linux, Mac OS X, Solaris and other Java enabled operating systems. Today, BEAM is in use by many end users of MERIS and AATSR data and also the Envisat Cal/Val team makes significant use of BEAM's analysing, visualizing and processing capabilities. The success of the open BEAM software package was also made clear during the first MERIS User Workshop held at ESRIN in November 2003 in that a growing number of users are already using or are willing to use the application programming interfaces of BEAM for their own developments using the Java™, C and IDL™ programming languages.



VISAT Main Window

VISAT Navigation and World Map Windows

VISAT Histogram and Scatter Plot

Overview

The main components of the BEAM are:

- VISAT - A visualization, analyzing and processing software
- A set of scientific data processors running either from the command line or invoked by VISAT
- A data product converter tool allowing a user to convert raw data products to RGB images, HDF-5 or the BEAM-DIMAP standard format
- A Java™ API which provides ready-to-use components for remote sensing related application development and plug-in points for new BEAM extensions
- Envisat MERIS/AATSR/ASAR Product Reader
- API for ANSI C and IDL™ allowing reading access to these data products using a simple programming model.
- Scientific data processing modules: FLH/MCI Processor, SMAC Processor, SST Processor, Smile Correction Processor, Level 3 Binning Processor, Level 3 Mosaic Processor

Product Format

VISAT and the scientific data processors use a simple data input/output format, which makes it easy to import ENVISAT data in other imaging applications. The format is called DIMAP and has been developed by SPOT-Image, France. The BEAM software uses a special DIMAP profile called BEAM-DIMAP, which may be easily read by e.g. ENVI™.

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Software Design

The primary design features of the BEAM offer important advantages to the user and the developers that want to contribute as well. Software frameworks with dedicated plug-in points for extended functionality enable extensibility. This will allow for easy integration of new algorithms, new data product I/O formats, map projections and much more.

The open source approach allows for distributed development resulting in a faster rate of growth, flexibility and stability. The BEAM source code is hosted at SourceFORGE.net, the world's largest Open Source software development website, that provides free and very convenient services to Open Source developers. This in turn makes developers contributions easy and safe.

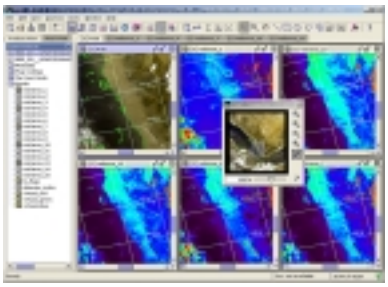
The important goal to offer portability for use on all major operating systems was achieved through platform-independent design. All components of the toolbox (except ANSI C and IDL™ API libraries) are coded in Java™. All releases were tested successfully on Windows 95-/98/NT4/2000, Linux, Solaris and Mac OS X. The ANSI-C API compiles on any system with an ANSI-C compliant C compiler.

Performance

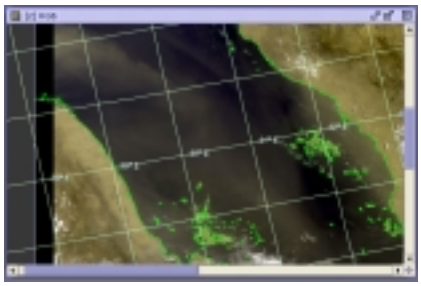
Since satellite data are most often huge files, it is very important to pay attention to high performance, both for I/O and computation. The BEAM developers at Brockmann Consult achieve this by using optimized algorithms and frameworks. For example, the image processing in VISAT is based on Java Advanced Imaging API (JAI).

Scientific Data Processors

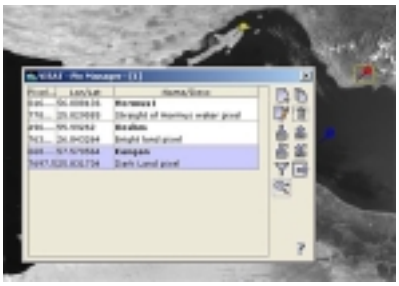
To support the scientific community in research and the exploitation of satellite data of various types and origin products, processors have been developed for the toolbox. For example, the application of the SMAC (Simplified Method for Atmospheric Correction), the calculation of Smile corrected radiances from ENVISAT MERIS L1b products, and two Level 3 processors are used extensively by the user community. The BEAM L3 Binning Processor provides a means to put long-term observations into data, allowing for any number of products. The Level 3 Mosaic Processor on the other hand has been specifically designed to create Moiré-free composites.



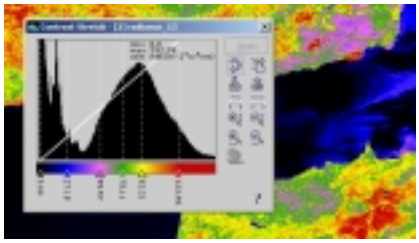
VISAT Synchronised Views



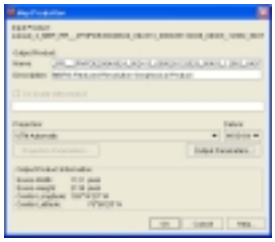
Graticule Overlay



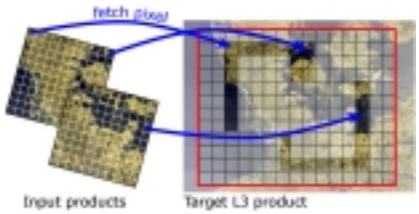
VISAT Pin Manager



VISAT Contrast Dialog



Map Projection Dialogue



Mosaic Binning Scheme

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