

AVO – January 2003 Science demo – GOODS/Jan03

Work Breakdown, V0.4, September 29th, 2002, F. Genova & M. Allen

Background

The “AVO Early Demonstrator“ is planned for release in January 2003. The AVO Science Demo – Draft Implementation Plan (June 2002) by the AVO SWG outlines the desired functionalities to be implemented in this demonstration.

This document describes the work breakdown for the “AVO Early Demonstrator- GOODS“ (GOODS/Jan03). This preliminary breakdown takes into account discussion with project participants from ESO, AstroGrid and CDS, and also the specifications in the AVO Science Demo – Draft Implementation Plan. The document also gives a preliminary description of interfaces and required collaboration between WAs.

Basic principles

In view of the short development time and the difficulty of the task, we adopt the following basic principles:

- A baseline demo should be defined in order to minimize risk. Possible additions and enhancements are identified and will be dealt with on a best effort basis.
- The work packages should be assigned for development by teams in their domain of expertise.
- All elements of the demo should have clean interfaces and comply as far as possible with interoperability standards, in particular VOTable input/output.

Baseline demo

The baseline demo consists of a visualizer, based on Aladin/VizieR, which will be used for browsing GOODS data sets, inspecting and selecting regions of interest. The re-extraction tool based on SExtractor is a separate package and will be as far as possible interfaced with the baseline demo. It is also planned to include SED plot capabilities if possible.

Target baseline datasets are GOODS data from ESO instruments. Chandra data will be included in the demo as far as possible.

On a technical point of view, usage of VOTable, UCDS and Web Service will be demonstrated.

Work Packages

The following work packages are defined, and are described in detail below.

WP1 Data: Procurement and homogenization of GOODS data sets

WP2 Image and catalogue display: Visualizer and catalogue interface

WP3 Extraction of catalogue data: UCD data selection and unit conversion

WP4 Re-extraction of catalogues from pixel data: SExtractor interactive tool

WP5 SED plot: SED plot from cross-matched catalogue data

Actions identified for each WP are in italics.

A general action is to define the required demo h/w-s/w configuration. The feasibility of using mostly local data has to be studied (WP to M. Dolensky, A. Richards).

WP1: Data

Baseline

Image data:

- Define list of image data to be used for demo
- Procure data, and construct preview images:
 - WA1 for ESO data
 - ??? for Chandra data
- Describe properties of image data:
 - Coordinate system projection
 - Calibration (zero points)
 - Units, and any peculiarities
 - WA1 for ESO data
 - ??? for Chandra data
- Put data in 'demo' storage:
 - Aladin/VizieR storage at CDS, WA2

Catalogue data:

- Compile default cross-matched multi-colour source catalogues from GOODS image data:
 - WA1

Test data:

- Preliminary versions of image and catalogue data will be used during the demo development phase when the final version is not available.

Additional

- *Can X-ray/radio/... other data be included in the catalogues? (A. Richards)*

WP1 contact persons

- WA1: M. Dolensky
- WA2: M. Allen
- WA3: TBD

WP2: Image and catalogue display

Baseline

Image and catalogue display baseline is based on the following usage scenario:

- A list of image data previews is given via a GOODS load button in Aladin (Number of previews TBD)
- The user chooses one or several previews
- Interface gives access to previews
- Pre-defined FOV can be overlaid to select image regions (Number and size of FOV TBD)
- The list of data (images/catalogues) available in this region is displayed
- The user selects data of interest from the list
- The full resolution images are displayed with catalogue overlays
- Clicking on the image gives access to catalogue data at that point or in selected region

To be developed (WA2)

- Visualiser is based on Aladin/VizieR
- Aladin 'Load' interface customization to access GOODS previews and full resolution data
- Organisation of data lists/hierarchy TBD (by wavelength domain?)
- Implement “data available in region“ function (if possible)
- Functions for large images (e.g. WFI): a cut-out function to generate sub-images for internal processes and also to provide image cut-outs for external queries (e.g. WP4)
- Image display and catalogue overlay based on current Aladin capabilities. Aladin plane stack gives access to data cubes of multiwavelength images, plus catalogues (contours, RGB composition also implemented)
- Extraction of catalogue data by clicking on images (or selected region of image) based on current Aladin capabilities. This produces a table containing the catalogue information for the selected objects and information about the table columns. VOTable output, plus link to UCD tool and unit conversion, to be developed. This extraction capability applies to the GOODS ‘pre-cooked’ catalogues and to other catalogues stored in VizieR.
- Aladin image server (cut-outs, full header, weight map, mask) (e.g. for WP4 needs). No need to implement COE coordinate projection system, use TANgent projection – already available.
- *Send information to all participants about the available collection of data in the Aladin demo storage and in VizieR (including a protected area for preliminary catalogues, to be developed) (F. Bonnarel/F. Ochsenbein).*

WP2 contact persons

- WA1: TBD
- WA2 image display/Aladin functionalities : P. Fernique/F. Bonnarel
- WA2 catalogues: F. Ochsenbein
- WA2, link with science specification: M. Allen
- WA3: TBD

WP3: Extraction of catalogue data

Baseline

- Selection of the photometric data of interest in the catalogue(s)
- Data (units) conversion e.g. for plotting functions (WP5)

UCD demo

To be developed (WA2)

- Selection of catalogues and data in catalogues using UCDs
- Data Conversion using UCDs/units (wavelengths/frequency/energy, magnitude/flux, for well defined cases with known zero points)
Possible extension: generalize the data conversion capability
- VOTable input for Aladin for visualisation of results

Output

Table of values with fluxes and wavelengths in VOTable format. NO object cross-match when these are not provided in the original table. Error bars and bandwidth are needed for proper SED plotting.

WP3 contact persons

- WA1: TBD
- WA2 UCDs: S. Derriere
- WA2 s/w: T. Boch
- WA3: TBD

WP4: Re-extraction from pixel data

Baseline

On-the fly re-extraction of catalogues by re-running SExtractor on the pixel data (Web Service demo).

Query/result communication

Input: http query sent from Aladin

Output: VOTable containing positions, fluxes

TBD

- SExtractor re-extraction parameters
- Query request scheme (could contain the URL giving access to the image)
- Images/sub-images for catalogue re-extraction may be supplied through the Aladin image

server (see WP2). Sub-images to be considered for large WFI images for transport efficiency (cut-outs). The other option is to store the images locally.

- Errors should be included in the re-extracted catalogues.
- *The interface between Aladin and ACE will be discussed by M. Hill and P. Fernique/F. Bonnarel.*

Open questions

- Cross-matching of re-extracted catalogues: positional cross-matching?
- Extraction of extended objects?
- Parameters needed to perform re-extraction, to be transmitted by Aladin, including management/display of information about parameters used in default catalogue extraction.
- Extraction from the WFI mosaic??

To be developed (WA3 and expertise from WA1):

INPUT NEEDED!

WP4 contact persons

- WA1: TBD
- WA2: P. Fernique
- WA3: M. Hill

WP5: SED plot

Baseline

- Plot of SEDs for
 - i. one or several objects from pre-defined cross-matched catalogue
 - ii. a set of objects within a selected region, using data from non-cross-matched catalogues
- *Detailed SED plot science specification will be discussed by M. Allen and A. Micol, who will prepare examples.*

Aladin/SED plot communication

- Select objects in table displayed by Aladin for SED plotting (VOTable format).
- Highlight a point in SED plot and see the table contents and position in the image display for the corresponding object.

Additional

- Include statistical functions on the SED plot
- Comparison of extracted SEDs with libraries of SEDs of known classes of objects

WP5 work breakdown