The GIRAFFE Archive : database and VO access

Royer F.[1], Jégouzo I.[1], Tajahmady F.[1], Normand J.[2]

(1) GEPI – Observatoire de Paris, France[†].   (2) VO-Paris Data Centre – Observatoire de Paris, France.

Abstract

GIRAFFE is an intermediate and high resolution multi-fibre spectrograph installed at VLT/UT2 (ESO) since 2003. Its scientific applications cover a wide range of topics: from stellar, to Galactic and extragalactic studies. The raw data collected by the instrument (science and calibrations) are part of the ESO archive (http://archive.eso.org). The GIRAFFE Archive, developed in Paris Observatory, provides **reduced spectra** once they are publicly available. These reduced spectra are produced automatically using the ESO GIRAFFE data reduction pipeline.

The reduced spectra can be accessed via the web interface of the database (**http://giraffe-archive.obspm.fr**) and in the Virtual Observatory via the SSA web service of VO-Paris Data Centre (**http://voparis-srv.obspm.fr/portal/**). Two collections are available in the VO: the 1D spectra (summed in the case of integral field observations) and the 3D field observations).

http://giraffe-archive.obspm.fr

1   Introduction

The GIRAFFE spectrograph (ESO VLT/UT2) has been collecting data since March 2003. Its multiplex facility allows the use of three different fibre configurations:

- Medusa (**MED**), where 135 individual fibres can be deployed inside the 25′ diameter field of view,
- **IFU**, where 15 separate 2″×3″ micro-lens arrays (4×6) can be deployed in the field of view,
- Argus (**ARG**), where a single central array is used (22×14), with two available spatial scales are: a sampling of 0.″52 and 0.″3 per micro-lens.
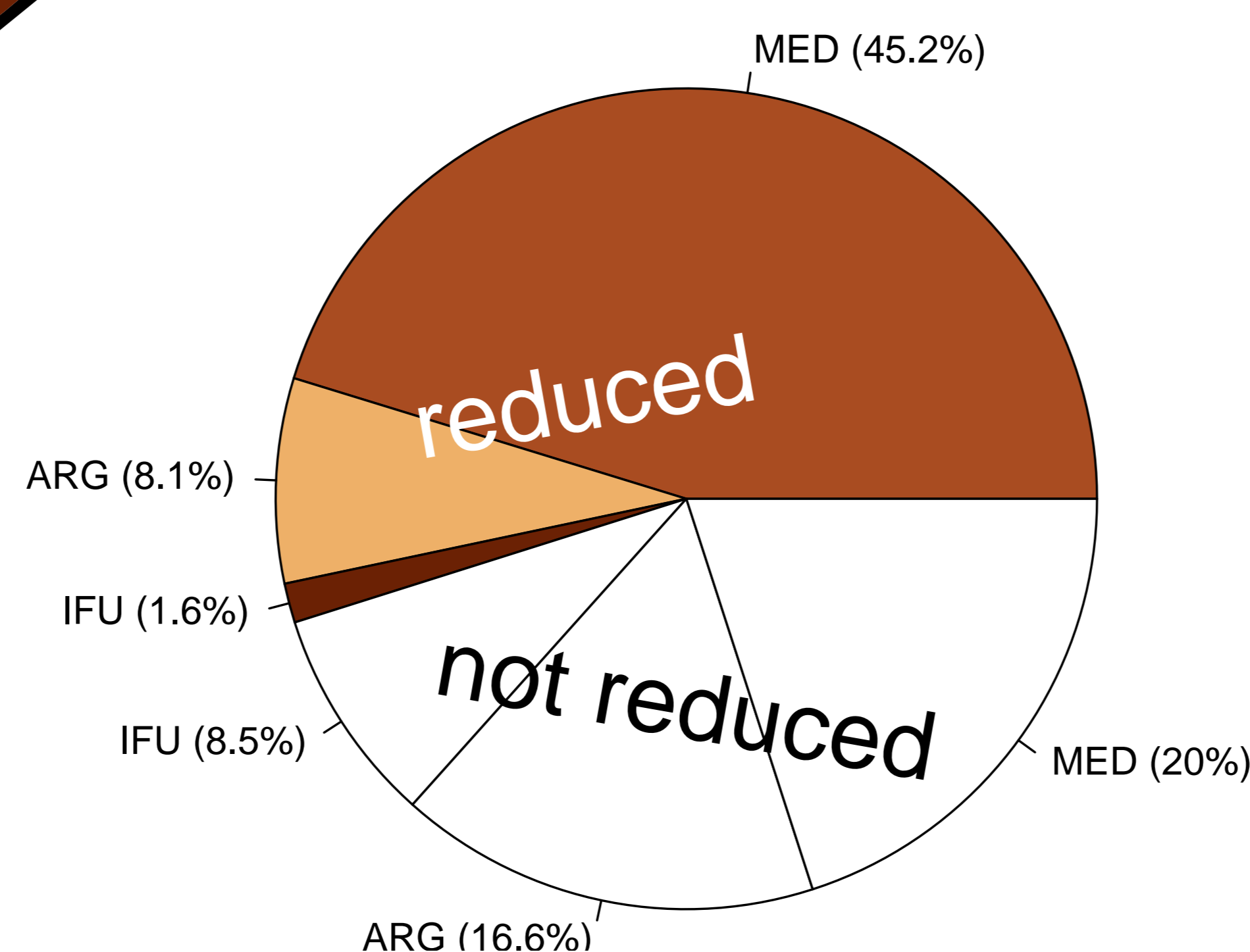

Figure 1: Current status of the content of the GIRAFFE Archive in the different observing modes (Medusa, Argus and IFU). The full pie chart is a statistical view of the SCIENCE data observed between March 2003 and December 2008 (9220 frames). The colored pieces correspond to the reduced fraction of the data, available in the GIRAFFE Archive. White pieces represent the fraction that is not reduced yet.

2   Data reduction process

The GIRAFFE Archive, developed in Observatoire de Paris, aims at distributing the *science ready* data, available via a web interface and providing VO access to 1D and 3D data.

The raw data are released one year after observation and fetched from the ESO science archive (http://archive.eso.org). The instrument produces a large amount of data (more than 9000 scientific observations from March 2003 to December 2008), and Fig. 1 shows the current status of the GIRAFFE Archive content and how data are distributed among the different fibre configurations.

The reduction is done using the ESO GIRAFFE pipeline in an automatic way. The daily calibrations are used (hence no dark subtraction as these frames are taken on a monthly basis). The sky subtraction is not yet included in the ESO pipeline, so this operation is not carried out on the data.

The products stored in the GIRAFFE Archive are:

- reduced spectra in the *native* format (FITS image where each column is an extracted spectrum), together with the corresponding error image and the full reduction log,
- FITS data-cube and its corresponding error cube (for IFU and Argus mode).

3   Mining GIRAFFE data

Two different approaches exist to perform data-mining using the GIRAFFE Archive:

- searching for full multi-object observations (**Field**), where the field center is the reference sky position,
- searching for individual objects (**Button**), where the object is the reference position.

In the case of IFU and Argus observations, individual spectra are the sum of the spectra collected in the integral field unit.

The two approaches are available **on the web interface** which offers a large amount of search criteria (Fig. 2), including the signal-to-noise ratio derived using *der_snr* algorithm (Stoehr et al. 2008). The individual spectra can be visualized in an interactive plot (Fig. 3), and several options are offered for download (e.g. Euro3d, multiple download).

The two approaches are also available **in the VO** through two different data collections: GIRAFFE 1D for the individual spectra (only in VOTable for the moment, see Fig. 4) and GIRAFFE 3D for the full multi-object observations (in *native* format, with the VO Paris Euro3D client (Chilingarian et al. 2008)).
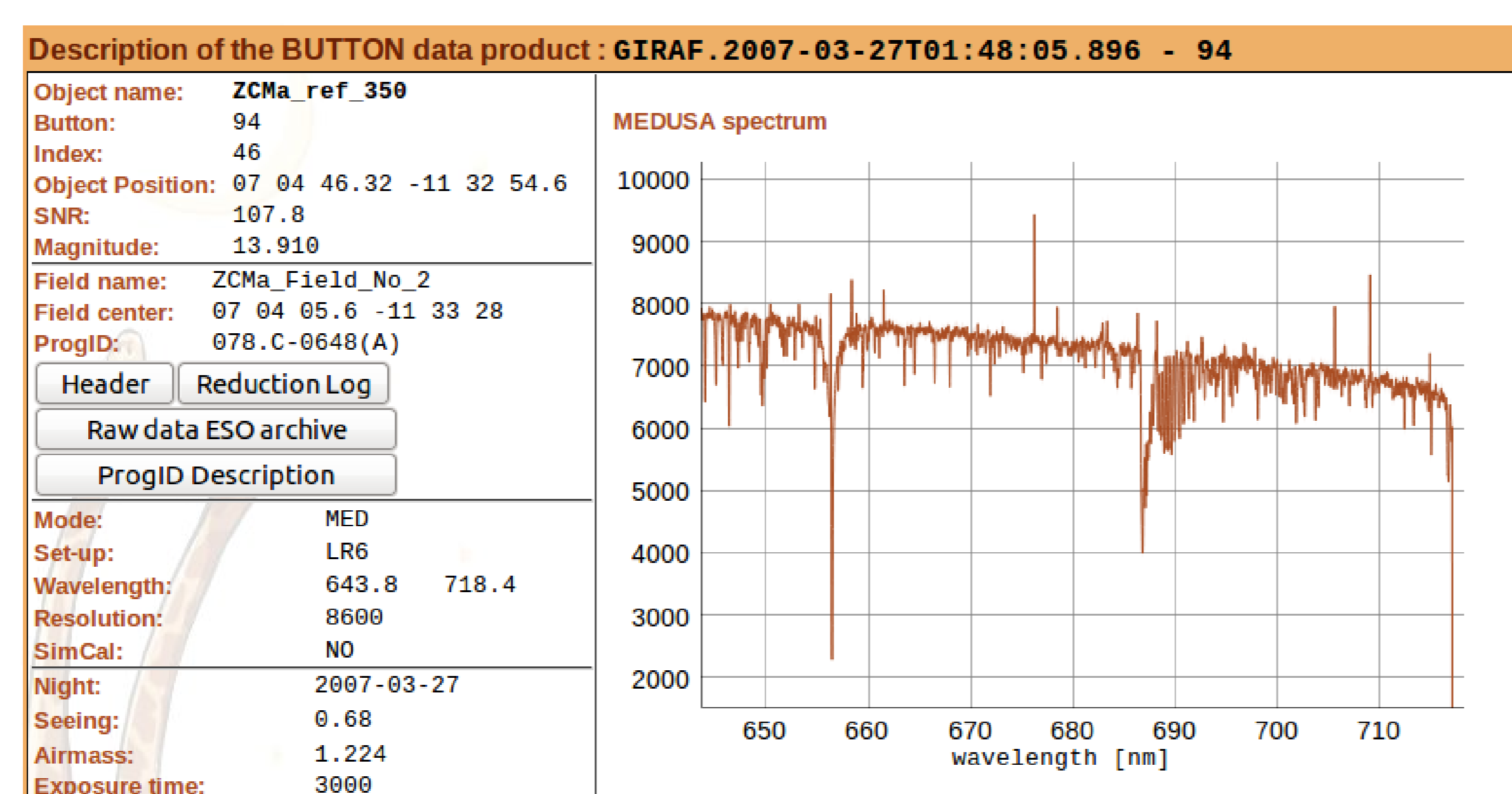

Figure 2: Snapshot of the search form to query the archive (**http://giraffe-archive.obspm.fr**). The choice between **Field** and **Button** at the top of the form allows to query either the "full observation" database, or the individual spectra database respectively. The form is divided into object related parameters and instrument related parameters.
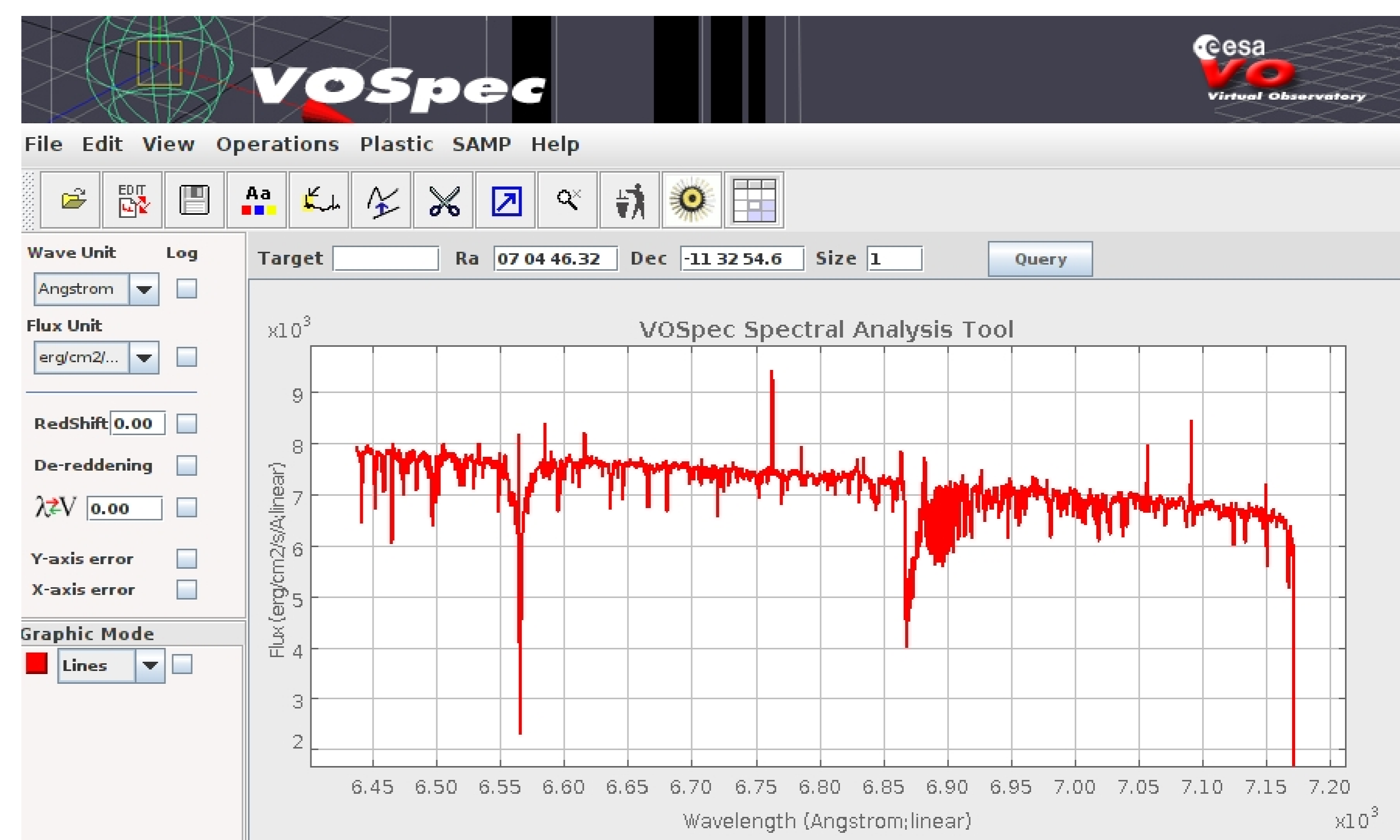

Figure 3: Snapshot of the web page describing a BUTTON data product (individual spectrum) from the archive. The reduced spectrum is plotted using dygraphs JavaScript Visualization Library.

Figure 4: Snapshot of the plot in VOSpec of the same 1D spectrum as in Fig. 3, using the VOTable output.

References

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