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V3D, Euro3D Visualization Tool – v0.1b

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User Guide

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Authors S.F.Sánchez

Contact S.F.Sánchez (ssanchez@aip.de)

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1 Introduction

1.1 Purpose and scope

This document describes how to install and use the Euro3D visualization tool (V3D).

The V3D handles IFS data (3D spectra) under the Euro3D data format. It main intention is to probide with a visualization tool for both spectra and imaging. It is based on the Lyon C-Library, and it used PGPLOT as graphic library with the TK drivers. It uses a TCL/TK script as GUI, although it can be used with user coded scripts.

The V3D has its own Share Memory Server, that allow external procedures to directly send data to be seen in the Visualization Tool.

Warning: The V3D is currently under development, and it could change within the time

1.2 Reference documents

[1]	*Euro3D Data Format v??.??* ??	?? ??/02/2003
[2]	*Euro3D I/O libraries v1.0a – Installation guide* A. Pécontal-Rousset, P. Ferruit and Y. Copin	issue 1.0a 31/03/2003
[3]	*Euro3D I/O libraries v1.0a – Developers guide* Y. Copin, P. Ferruit and A. Pécontal-Rousset	issue 1.0a 31/03/2003

Document [1] is available at `http://www.aip.de/Euro3D`.

1.3 Abbreviations and acronyms

AD	Applicable Document
AIP	Astrophysikalisches Institut Postdam
DIT	Detector Integration Time
DQ	Data Quality
ESO	European Southern Observatory
FITS	Flexible Image Transport System
FWHM	Full Width at Half Maximum
HDU	Header and Data Unit
IFS	Integral Field Spectroscopy
IFU	Integral Field Unit
MPE	Max-Planck Institut für extraterrestrische Physik
NDIT	Number of DIT
NIR	Near Infra-Red
NOST	Nasa / Science Office of Standards and Technology
PA	Position Angle
PSF	Point Spread Function
RD	Reference Document
RON	Read-Out Noise
RMS	Root Mean Square
SPAXEL	SPAtial piXture ELement
S/N	Signal-to-Noise ratio
TBD	To Be Determined

WCS	World Coordinate System
V3D	Euro3D Visualization Tool
LCL	Lyon C-Library

2 Installation

2.1 Presentation

In this section we describe how to install the V3D. Prior to install the V3D, you will need to install the Euro3D I/O libraries. The installation procedure is detailed in the `Installation Guide` of the Euro3D I/O libraries [2]. You need also to install PGPLOT, including the TK drivers (XTK on "drivers.list", see PGPLOT User Guide ref ??). V3D uses also the NCAR mathematical libraries (ref ??). You need to have properly defined the environment variables PGPLOT_DIR and NCARG_ROOT to install V3D.

2.2 Installing V3D step by step

In the following, we describe, step by step, the procedure to follow to install V3D.

1. Install and test the Euro3D I/O library, PGPLOT and NCARG libraries.
2. Download the current version of the V3D distribution `v3d-1.0.tar.gz` from `http://???` , and copy it into the Euro3D directory (given by the environment variable `$IFU_PATH`).
3. Using the command `tar xvfz v3d-1.0.tar.gz` , extract the archive file `v3d-1.0.tar.gz` under `$IFU_PATH`. It will create the directory `v3d-1.0` .
4. Goes into this directory (`cd v3d-1.0`), and execute the configure and make scripts.
   (a) `./configure`
   (b) `make`

   Warning: The make can fail due mainly to a different definition of certain libraries. We have test the procedure under the two main Linux distributions, RedHat (7.1 and 8.0) and Suse (8.2). They differ in the definition of TCL/TK libraries. You should edit the file `add_def/makedefs.local` and select the proper definition for your distribution

5. Goes to the scripts directory (`cd scripts`) and execute the install script (`./install.pl`). This script will edit the `tk_e3d.tcl` script to be compatible with your directory tree.
6. Add the directory `user/bin` under the V3D tree to your PATH.
7. Test the V3D executing the script `tk_e3d.tcl` , and loading the file `test.fits` under the `scripts` directory.

3 The V3D GUI: tk_e3d.tcl

3.1 Presentation

In this section we describe the main properties of the E3D GUI, the TCL/TK script `tk_e3d.tcl`. If you have followed properly the previous sections you should be able to execute it by just typing `tk_e3d.tcl` . This script will run the `tk_e3d` TCL/TK interpreter, and open a GUI. This GUI have a main window with plotting frame and a toolbar containing 7 menus/buttons:

1. `LOAD` Button to load a new Euro3D formatted IFS file. It opens a prompt asking for filename. In case of activated the SHM (see below), it is possible to ask for the data on it, writting "SHM" as filename. When a file is loaded the staked spectra (the complete serie of spectra contained in the file) are plotted in the main frame.
2. `SCALE` Menu to handle the colormap, bright, contrast and intensity inversion.
3. `SPAXELS` Menu to handle the SPAXELS inspector. It allows to open this inspector, select a wavelength range for displaying on it and force a plotting.
4. `SPECTRA` Menu to handle the SPECTRA inspector. It allows to open this inspector, select a SPAXELS range for displaying on it and force a plotting.
5. `MAP` Menu to change the parameters of the interpolation for map creation.
6. `SHM` Button to start the SHM server (explained in Section ??)
7. `QUIT` Button to exit from the V3D GUI.

The GUI aslo contains an information/prompt pannel on the left size, including the current MAX/MIN values plotted, a bright and contrast select bars and a the current selected wavelength range (see in the SPAXELS inspector).

Warning: The V3D GUI is currently under development and can have severe changes.

3.2 SPAXELS inspector

The SPAXELS inspector allow to visualize the monochromatic/broadband intensity in the different SPAXELS (spatial elements, eg fibers or lenslets). In order to use it you should press the `open` button under the `spaxels` menu. This will open a new window containing a main frame and 8 small frames, a toolbar and a information pannel (similar to the general window info pannel). To visualize the spatial distribution of a certain wavelength region you should select the `Range` tick-mark on the `spaxels menu`, then you can select a initial wavelength clicking with the mouse left-button on the main window frame (ie, the staked spectra), then clicking again the mouse left-button you select the final wavelength. Clicking now the mouse right-button you will obtain the spatial intensity distribution of the selected wavelength range.

The spatial distribution is seen both in the main plotting frame of the SPAXELS inspector and one of the small plotting frames. If now you select a new wavelength range, you will fill a new small plotting frame. You can change back to the previous selection by clicking on the corresponding small frame.

The SPAXELS inspector toolbar contain 5 menus/buttons:

1. `Blink` Allows to blink between different wavelength range selections. Click over the `Blink` button and then select the different selections by clicking over the corresponding small frames. Once you have completed the selection click again over the `Blink` button.
2. `Shape` Allows to select different represantions of the SPAXELS:
   (a) `Fill` areas filled with the corresponding intensity, following the shape of the spaxel group (see Euro3D format ref ??).

Warning: AAA

4 FAQ

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