Requirements for a 3D Visualisation Tool for spectral data from the ESO VLT

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(presented by D. Petry)
The Purpose

- In 2012, all UTs will host at least one IFU
  - FLAMES, VIMOS, SINFONI, K-MOS, MUSE
- 3D visualisation tools are used for instrument commissioning and quality assessment on the off-line workstation
- There is no software “owned” by ESO
  - No guaranteed availability
  - Not specifically adapted for VLT instruments
Project Scope

- Define requirements for a scientific 3D visualisation tool
  - Instrument commissioning
  - Scientific validation
  - Support for data analysis extensions
- Evaluate existing visualisation platforms and the feasibility of a development
- Proceed to design and detailed planning (end 2010)
- If positive, proceed to development (mid-2012)
Requirements

1. Reading and Viewing
   - Multi-extension FITS files
   - Supports data, variance, and quality
   - IFUs and Burst mode support

2. Display Layout
   - “QFitsView” display capability
   - color LUTs, ITTs, cut levels
   - X,Y,Z projections (not arbitrary planes)
3. Plugins and extensions

- Extending the user interface (adding specialised visualisation panels)
- Invoke the viewer from command-line
- Invoke external scripts (Python, IDL)
- Macro language to automate visualisation tasks
Requirements

4. Basic Scientific Analysis

- Image reconstruction over a wavelength range
- RGB image reconstruction
- Spectral extraction over a region
- 2D Gaussian fit
- Single Gaussian line-fit
- Basic sky subtraction
- Basic continuum subtraction
5. File export
- Export extracted regions to FITS with WCS information
- Export displays to graphic formats (jpeg, png)

6. Multiple visualisation buffers
- Compare images and 1D-spectra

7. Catalogues overlay
- Query and display catalogues
- Overlay contour plots
Requirements

8. Performance
   - Supports 32-bit and 64-bit
   - Typical configuration
     - Quad-core, 64-bit OS, 8 GB RAM,
     - Disk I/O above 100 Mbytes/sec

9. Licensing
   - Open source project
Questions to the CASA team

- Is there an interest in adding functionality useful for optical data cubes (wavelength)?
- Are there plans for a plug-in interface of some kind?
- How about introducing the concept of a variance (stat. error or noise measure) for each pixel (+ parallel display of the two related maps)?
- Many thanks in advance for your efforts.