

Characterisation v.2 use-cases

3rd update on the full spectrum fitting – UWS

(1st in Nara, 2nd in Trieste/EuroVO-ICE)

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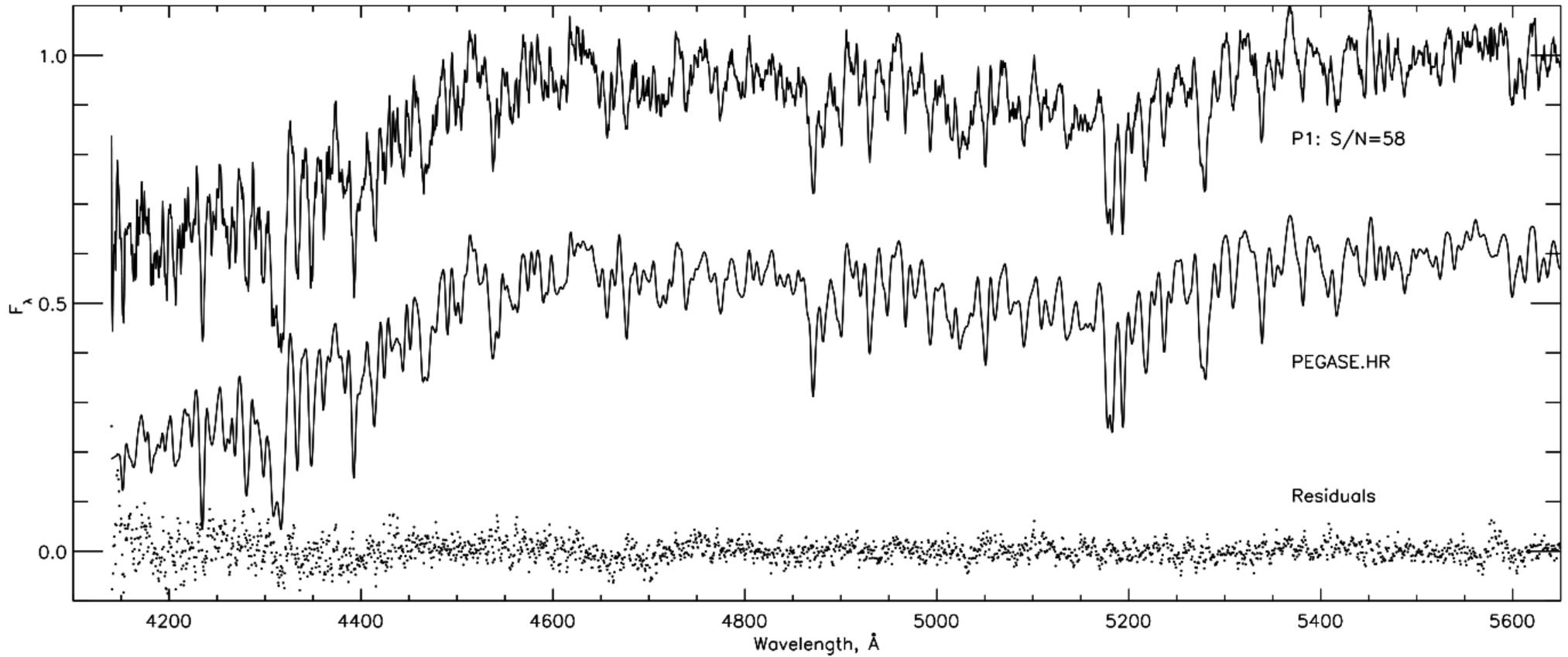
Pierre Le Sidaner (*VO-Paris*)

acks to:

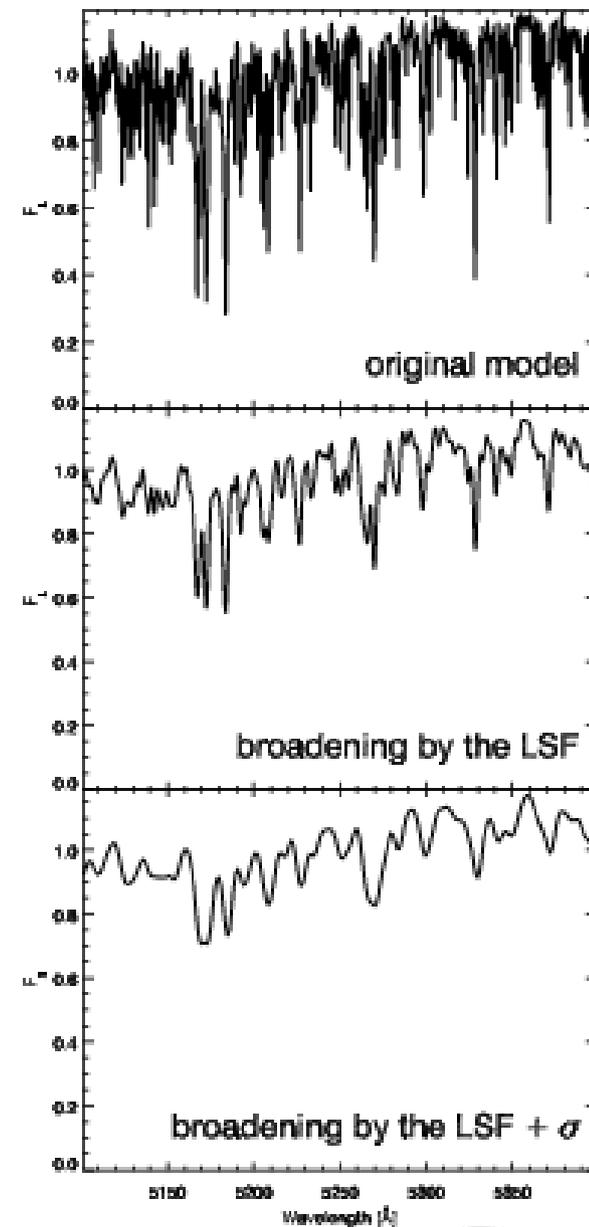
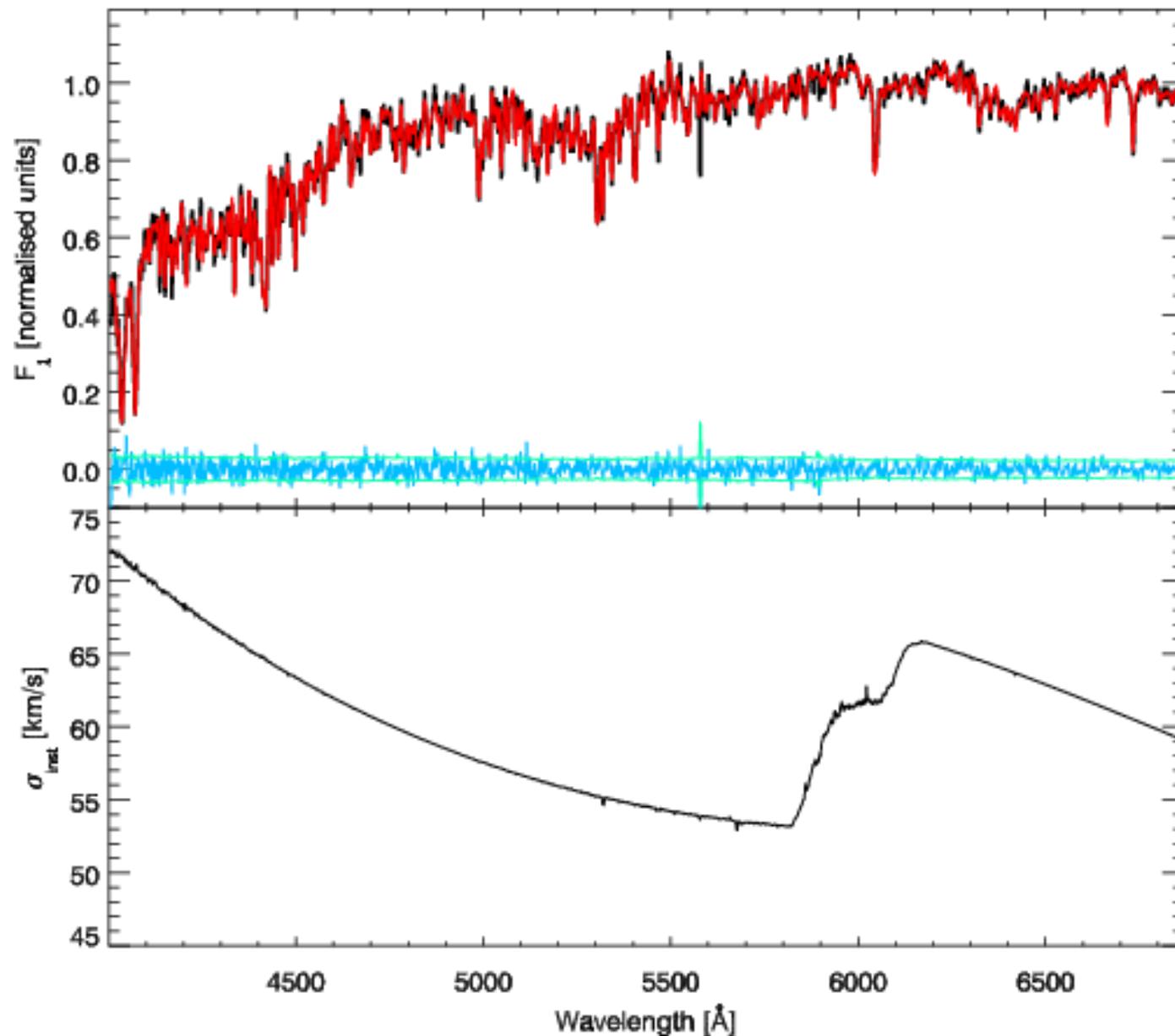
André Schaaff (*CDS*) and Jérôme Berthier (*IMCCE*)

Full spectrum fitting

- A model is fitted against an observed 1D-spectrum. It has to be convolved with the instrumental response
- Need to know the spectral resolution variation along the wavelength



Example: 1D spectrum (SDSS)



Algorithm implementation

- Penalized Pixel Fitting algorithm (Cappellari & Emsellem 2004)
 - Original code is implemented in IDL and available from the author's homepage
- Re-implemented from scratch in C as a command-line tool
 - GNU Science Library (GSL)
 - levmar-2.5 – an open-source implementation of the Levenberg-Marquardt constrained nonlinear least-square fitting algorithm in C (depends on ATLAS)
 - cfitsio for FITS I/O support
 - I/O of the IVOA Spectrum DM FITS serialization
 - Support of the spectral resolution variation along the wavelength range
- PERL part (http CGI)
 - Parsing Characterisation v.2 XML, extracting and parsing the Access object
- Java part (UWS) – possibility of having multiple results
 - CDS UWS Library v3 (Apache Tomcat as a framework), UWS v3 examples
 - WADL description
 - XSLT transformations for displaying statuses and descriptions

- **SSAP “proxy” to access SDSS DR7 data**
 - Translation of SSAP request into SDSS SQL, submission to SDSS CAS/DAS
 - Translation of SDSS CAS/DAS response into the SSAP query response format
- **2 translators**
 - SDSS 1D spectrum into the IVOA Spectrum DM (in FITS or VOTable)
 - SDSS 1D spectrum metadata into Characterisation v.2 XML
- **Parser of Characterisation v.2 XML**
 - Fetch and extraction of the resolution VariabilityMap
 - Conversion into the format acceptable by the PPXF C command-line implementation
- **HTML interface to a UWS service (Web-SAMP connector)**
 - Input data links (spectrum + CharDM description) from Aladin
 - Links to the fitting results which are sent to VOSpec using SAMP

ToDo and Questions

- WADL-based command-line PERL client
- Automatic WADL-based interface generation – do we really need it? Some generators are already available – is it worth using one of them?
- Can we add semantics to the input? i.e. automatically recognise that a given service does something with 1D spectra and produces 1D spectra (and not just “opaque” URLs)
- Web-SAMP connector or SAMP Web profile?