

VVDS DATA ACCESS THROUGH VO SERVICES

B. Garilli¹, L. Paoro¹, V. Le Brun², O. Le Fèvre², P. Franzetti¹, M. Fumana¹, and M. Scodreggio¹

¹INAF,IASF-Milano,Italy

²LAM, Marseille, France

1. INTRODUCTION

The most recent public cosmological surveys (like VVDS, GOODS, DEEP2, COSMOS, etc.) aim at providing a complete census of the universe over a broad redshift range. Different information obtained with different instruments (e.g. spectrographs, HST, X-ray telescopes, etc.) are gathered, and it is only by correctly assembling and easily manipulating such wide sets of data that the full power of these surveys is fully exploited, helping astronomers in the attempt to describe the universe. The Virtual Observatory Alliance defines a set of services which can satisfy the needs described above, exploiting Web Services technology. Here we present our implementation of some VO services in the framework of the Vimos VLT Deep Survey (VVDS) Data release

2. VO SERVICES FOR VVDS DATA

In February 2007, the first epoch VVDS photometric and spectroscopic data have been released to the public (Le Brun et al. (2007), see <http://cencosw.oamp.fr>), while the VVDS-CDFS data set is public since 2004 (Le Fevre et al. , 2004). The complete data set comprises 12000 spectra, with associated optical photometry down to $I=24$. For each spectrum (wavelength and flux calibrated) a redshift measurement has been made, and a confidence class for such measure is associated to it (Le Fevre et al. , 2005). On these data sets, we have implemented and published the fundamental VO services Cone Search, SIA, SkyNode (see also Paoro et al. (2006)), and now SSA.

Our SSA service is query compliant with SSA v0.97 (Tody et al. , 2007), and provides spectra as FITS serialization of the Spectra Data Model v1.0 (McDowell et al. , 2007). It is one of the few SSA v0.97 services published so far.

Our intention is to keep the SSA service up to date, following the last protocol and data model specifics while they are progressing. The final goal is to produce a SSA service full query compliant with the last protocol version

| ID | z | B mag | V mag | R mag | I mag | J mag | K mag | CLASS |
|------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-------|
| S788 | 0.22445 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 3 |
| S789 | 0.22445 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 3 |
| S790 | 0.22445 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 3 |
| S791 | 0.22445 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 3 |
| S792 | 0.22445 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 3 |
| S793 | 0.22445 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 3 |
| S794 | 0.22445 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 3 |
| S795 | 0.22445 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 3 |
| S796 | 0.22445 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 3 |
| S797 | 0.22445 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 3 |
| S798 | 0.22445 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 3 |
| S799 | 0.22445 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 3 |
| S800 | 0.22445 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 24.041921 | 3 |

Figure 1. A (small) part of the VVDS catalog as published on the VO. Available information include B,V,R,I,J,K magnitudes, as well as redshift information and spectral data

available at that moment, adding the support of VOTable and native spectra data format. Thus, a part from the astronomical information contained, this data set can also be useful as a testing bench for the future development of spectroscopic application tools, as well as for further refinements of the definition of the Spectra Data Model and the SSA protocol.

3. EXAMPLE OF VVDS DATA MINING THROUGH VO SERVICES

In Fig. 1, we present a snapshot of the VVDS spectroscopic catalog, as is obtained by a Cone Search made through TOPCAT. With respect to the more classical query through dedicated web pages, and download of the data, VO services and applications have the advantage of providing a ready to use simple interface to explore the different data sets, without physically retrieving them. In Fig. 2, for example, we look at the spatial distribution of the sources.

Using the user's preferred VO application, coupled with VO services, it is easy and fast to pin down the kind of objects or products one is interested in, and make more refined searches on well focused objects. In the following example, we want to look at high quality spectra of objects at redshift $z > 3$. From the distribution in Fig. 3, which has been directly obtained without any download, we see that such objects are roughly a dozen, out of a catalog of few thousand objects. Thanks to the SSA service, we can look at such 14 spectra (in Fig. 4 we use SPLAT-VO), and for example choose only those showing

