ESO Science Archive Facility - Phase 3 Data Release Description
ESO programme The Great Observatories Origins Deep Survey - VLT/VIMOS spectroscopy, Data Release DR2.0.1
provided by Catherine Cesarsky, published on 2014-12-12

ESO Phase 3 Data Release Description

Data Collection	GOODS_VIMOS_SPEC
Release Number	1
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GOODS/VIMOS Spectroscopy: Data Release Version 2.0.1

Multi-object spectroscopy of faint galaxies in the Chandra Deep Field South (CDFS) has been carried out, as part of the Great Observatories Origins Deep Survey (GOODS), using the VIsible Multi-Object Spectrograph (VIMOS) instrument mounted at the Melipal Unit Telescope of the VLT at ESO's Cerro Paranal Observatory, Chile. The GOODS/VIMOS spectroscopic campaign is part of the ESO/GOODS program in the CDFS, which complements the FORS2 ESO/GOODS spectroscopic campaign. This data release contains the redshift catalog resulting from the full data set of the GOODS/VIMOS spectroscopic campaign of the ESO/GOODS large programme 171.A-3045 (P.I. C. Cesarsky) which have been obtained in service mode observations between September 2004 and January 2007. The GOODS/VIMOS campaign is structured in two separate surveys using two different VIMOS grisms. The VIMOS Low Resolution Blue (LR-Blue) and Medium Resolution (MR) orange grisms have been used to cover different redshift ranges. The LR-Blue campaign is aimed at observing galaxies mainly at $1.8<z<3.5$, while the MR campaign mainly aims at galaxies at $z<1$ and Lyman Break Galaxies (LBGs) at $z>3.5$ The full GOODS/VIMOS spectroscopic campaign consists of 20 VIMOS masks. Reduced data products from the first 12 masks were part of the first release and described in Popesso et al. 2009. This second release completes the whole VIMOS campaign by adding 8 new masks to the previous release. In total we obtained 5052 spectra, 3634 from the 10 LR-Blue masks and 1418 from the 10 MR masks. A significant fraction of the extracted spectra comes from serendipitous observed sources: ~21% in the LR-Blue and ~16% in the MR masks. We obtained 2242 redshifts in the LR-Blue campaign and 976 in the MR campaign for a total success rate of ~62% and ~69% respectively, which increases to ~66% and ~73% if only primary targets are considered. The typical redshift uncertainty is estimated to be σ_z~0.0012 (~255 km/s) for the LR-Blue grism and σ_z~0.0004 (~120 km/s) for the MR grism.

A full description of the survey can be found in the accompanying publication "The Great Observatories Origins Deep Survey - VLT/VIMOS Spectroscopy in the GOODS-South Field: Part II" by Balestra et al. (2010), A&A 512, A12.

The Archive Science Group migrated the GOODS-VIMOS dataset to the Phase 3 infrastructure allowing seamless publication with the Science Data Products. Although it was possible to recover the information needed for most of the files, ASG would like to inform the archive users that for the science data products (1D-spectra) it was not possible to trace back the complete provenance information. Hence there can be inconsistencies between the number of provenances and the values of NCOMBINE, EXPTIME keywords; between the values of MJD-OBS, MJD-END and the related information found in the provenance. In particular MJD-END does not conform to the Phase3 definition, i.e. in this case its value does not indicate the end of the latest observation, but it is MJD-

OBS+EXPTIME. Since the provenance information could not be fully recovered it was not possible to fix the value of MJD-END.

Overview and survey layout

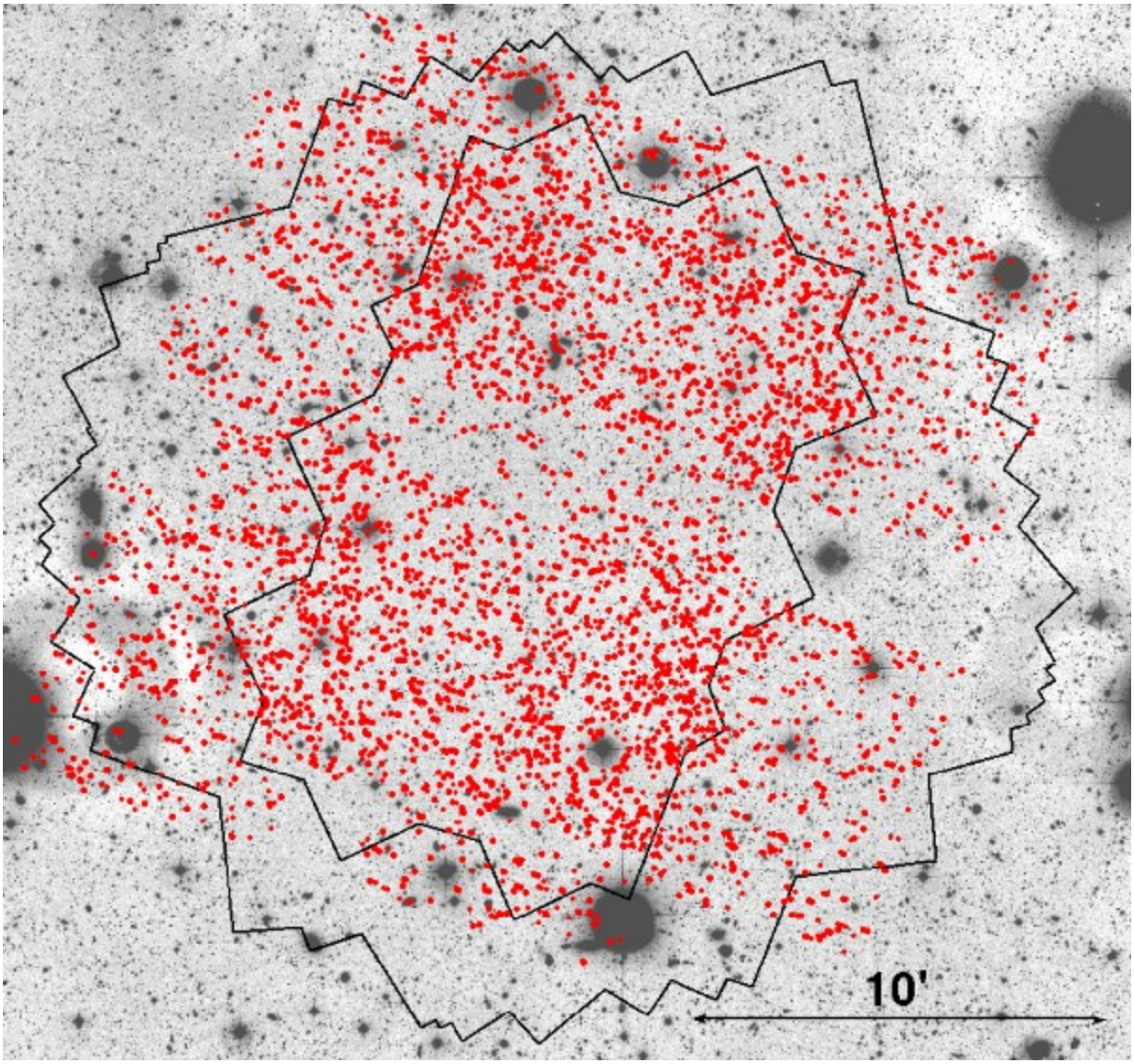

Fig.: Spatial distribution of objects from the whole (LR-Blue plus MR grism) GOODS/VIMOS spectroscopic campaign (red circles) over the ESO-WFI R-band image. The contours outline the area of the 2 Ms exposure of the CDFS and the GOODS-S field.

The GOODS/VIMOS survey has been designed to complement the GOODS/FORS2 spectroscopic survey (Vanzella et al. 2005, 2006, 2008) in terms of completeness and sky coverage. The target selection is based on the multiwavelength photometry available for the GOODS-S field. Different criteria have been used for the low resolution LR-Blue grism and the medium resolution MR Orange grism. According to the usable wavelength ranges targets with estimated redshifts between 1.8 and 3.8 have been selected for observations with the VIMOS LR-Blue grism, targets with redshift $z < 1$ or

2.8 < z < 4.8 have been selected for observations with the VIMOS MR Orange grism. A magnitude cut R < 25 AB has been applied to the LR-Blue targets. Please refer to Popesso et al. (2009) and Balestra et al. (2010) for a detailed description of the target selection procedure.

Release content

Summary of reduced VIMOS observations

Mask ID	Date	Exp. time (s)	Rel. no.
LR-Blue masks			
GOODS_LRb_001	Sept.-Oct. 2004	10x1440	1
GOODS_LRb_001_1	Nov. 2004	10x1440	1
GOODS_LRb_002	Oct.-Nov. 2004	10x1440	1
GOODS_LRb_003_new	Oct. 2005	10x1440	1
GOODS_LRb_003_new_1	Oct.-Nov. 2005	10x1440	1
GOODS_LRb_003_new_2	Nov.-Dec. 2005	10x1440	1
GOODS_LRb_002_1	Dec. 2004	10x1440	2
GOODS_LRb_dec06_1	Nov. 2006	10x1440	2
GOODS_LRb_dec06_2	Nov. 2006	10x1440	2
GOODS_LRb_dec06_3	Nov.-Dec. 2006	10x1440	2
MR masks			
GOODS_MR_001	Nov. 2004	12x1200	1
GOODS_MR_002_1	Jan. 2005	12x1200	1
GOODS_MR_new_1	Dec. 2005	12x1200	1
GOODS_MR_new_2	Jan. 2006	12x1200	1
GOODS_MR_new_2_1	Jan. 2006	12x1200	1
GOODS_MR_new_3_c	Sept.-Oct. 2006	12x1200	1
GOODS_MR_dec06_1	Oct. 2006	12x1200	2
GOODS_MR_dec06_2	Oct.-Nov. 2006	12x1200	2
GOODS_MR_dec06_3	Oct. 2006	12x1200	2
GOODS_MR_dec06_4	Jan. 2007	12x1200	2

Table 1: Log of VIMOS observations for the entire GOODS/VIMOS spectroscopic campaigns. Columns list the following information: (1) GOODS/VIMOS mask identification number, (2) date of the observations, (3) number of exposures per mask times duration of single exposure and (4) release number (1=Popesso et al. 2009; 2=Balestra et al. 2010).

The VLT/VIMOS spectroscopic observations were carried out in service mode during ESO observing periods P74-P78. A log of all the GOODS/VIMOS observations is presented in Table 1. The total exposure time per mask is 4 h. Each LR-Blue mask consists of 10 exposures of 24 min, while each MR mask consists of 12 exposures of 20 min. All the masks were designed with 1 arcsec slits. The spatial scale for VIMOS is 0.205 arcsec/pixel.

In the LR-Blue campaign, the LR-Blue grism was used together with the Order Sorting OS_Blue cutoff filter. In this configuration the useful wavelength range is 3700-6700 Å, the nominal resolution is $R=\lambda/\Delta\lambda=180$, corresponding to a spectral resolution of ~28 Å, and the dispersion is 5.7 Å/pixel.

The MR grism and the GG475 filter were used in the MR campaign. In this configuration the useful wavelength range is 4800-10000 Å, the nominal resolution is R=580, which corresponds to a spectral resolution of ~13 Å, and the dispersion is 2.55 Å/pixel.

The total number of GOODS/VIMOS spectra extracted is 3634 in the LR-Blue and 1418 in the MR campaign. We have identified 3305 single LR-Blue objects and 1297 single MR objects. Out of those, we were able to determine 2074 and 885 redshifts in the LR-Blue and the MR campaign, respectively.

The following table shows the breakdown by redshift quality class.

	A	B	C	X	total
LR-Blue grism	853	542	847	1392	3634
MR Orange grism	628	200	148	442	1418

In analogy to the complementary GOODS/FORS2 redshift campaign, we defined four quality flags to indicate the quality of a redshift estimate as follows:

- flag A, high quality: several emission lines and strong absorption features are well identified;
- flag B, intermediate quality: at least two spectral features are well identified, for instance one emission line plus few absorption features;
- flag C, low quality: spectral features, either in emission or in absorption, are less clearly identified;
- flag X, no redshift estimated. No features identified.

The reliability of VIMOS LR-Blue redshifts with quality flag A, B, and C is estimated to be approximately 100%, 60%, and 20% confidence level, respectively. VIMOS MR quality flag-A, -B, and -C redshifts are estimated to be reliable at approximately 100%, 95%, and 60% confidence level, respectively.

Release Notes

Data reduction method

The pipeline processing of the GOODS/VIMOS data was carried out using the VIMOS Interactive Pipeline Graphical Interface (VIPGI, Scodeggio et al. 2005). Details of the data reduction and analysis are fully described in the papers Popesso et al. 2009, A&A, 494, 443 and Balestra et al. 2010.

Data format

For each spectrum the following data products are being released: the 1-dimensional spectrum in FITS format and the corresponding plot of the spectrum in postscript format. The following naming convention has been adopted for the individual files:

GOODS_LRb_<bb>.fits	1-d spectrum (LR-blue grism)
GOODS_LRb_<bb>.spec.ps	spectrum plot (LR-blue grism)
GOODS_MR_<bb>.fits	1-d spectrum (MR grism)
GOODS_MR_<bb>.spec.ps	spectrum plot (MR grism)

where <bb> indicates the mask ID of the observation, quadrant, slit and object number.

The redshift catalog include the entire GOODS/VIMOS campaign. It contains the following information: (column 1) the coordinate-based GOODS identification number, where the coordinates used are those of the matching WFI object, (column 2) the VIMOS identification number, (columns 3-4) the coordinates of the matching WFI object, (columns 5-6) the original VIMOS coordinates, (columns 7-10) B- and R-band WFI magnitudes with the corresponding errors, (columns 11-12) z850 GEMS magnitudes and corresponding errors, (column 13) redshift, (column 14) quality flag, (column 15) comments and identified spectral features, (column 16) a label for primary or secondary (i.e. serendipitous) objects, (column 17) release number (1=Popesso et al. 2009; 2=Balestra et al. 2010), (column 18) data link to the original spectrum. All magnitudes are given in the AB system.

Data retrieval

The data from the GOODS/VIMOS spectroscopic campaign can be queried and requested from the ESO Science Archive using the ESO Data Products Query Form:
http://archive.eso.org/wdb/wdb/adp/phase3_main/form

and the catalogue via the query interface: http://www.eso.org/qi

Acknowledgements

When using data products provided in this release, we request acknowledgement of the ESO/GOODS project and referring to the related publication by Balestra et al. (2010), A&A 512, A12. Please also use the following statement in your articles when using these data:

Based on observations made with ESO Telescopes at the La Silla or Paranal Observatories under programme ID 171.A-3045.