

J/A+A/642/A192 C3R2-KMOS zsp & galaxy physical properties (Euclid Coll., 2020)

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Euclid preparation: VIII. The Complete Calibration of the Colour-Redshift Relation survey: VLT/KMOS observations and data release.

Euclid Collaboration, Guglielmo V., Saglia R., Castander F.J., Galametz A., Paltani S., Bender R., Bolzonella M., Capak P., Ilbert O., Masters D.C., Stern D., Andreon S., Auricchio N., Balaguera-Antolinez A., Baldi M., Bardelli S., Biviano A., Bodendorf C., Bonino D., Bozzo E., Branchini E., Brau-Nogue S., Brescia M., Burigana C., Cabanac R.A., Camera S., Capobianco V., Cappi A., Carbone C., Carretero J., Carvalho C.S., Casas R., Casas S., Castellano M., Castignani G., Cavuoti S., Cimatti A., Cledassou R., Colodro-Conde C., Congedo G., Conselice C.J., Conversi L., Copin Y., Corcione L., Costille A., Coupon J., Courtois H.M., Cropper M., Da Silva A., de la Torre S., Di Ferdinando D., Dubath F., Duncan C.A.J., Dupac X., Dusini S., Fabricius M., Farrens S., Ferreira P.G., Fotopoulou S., Frailis M., Franceschi E., Fumana M., Galeotta S., Garilli B., Gillis B., Giocoli C., Gozaliasl G., Gracia-Carpio J., Grupp F., Guzzo L., Hildebrandt H., Hoekstra H., Hormuth F., Israel H., Jahnke K., Keihanen E., Kermiche S., Kilbinger M., Kirkpatrick C.C., Kitching T., Kubik B., Kunz M., Kurki-Suonio H., Laureijs R., Ligori S., Lilje P.B., Lloro I., Maino D., Maiorano E., Maraston C., Marggraf O., Martinet N., Marulli F., Massey R., Maurogordato S., Medinaceli E., Mei S., Meneghetti M., Benton Metcalf R., Meylan G., Moresco M., Moscardini L., Munari E., Nakajima R., Neissner C., Niemi S., Nucita A.A., Padilla C., Pasian F., Patrizzii L., Pocino A., Poncet M., Pozzetti L., Raison F., Renzi A., Rhodes J., Riccio G., Romelli E., Roncarelli M., Rossetti E., Sanchez A.G., Sapone D., Schneider P., Scottez V., Secroun A., Serrano S., Sirignano C., Sirri G., Sureau F., Tallada-Crespi P., Tavagnacco D., Taylor A.N., Tenti M., Tereno I., Toledo-Moreo R., Torradeflot F., Tramacere A., Valenziano L., Vassallo T., Wang Y., Welikala N., Wetzstein M., Whittaker L., Zacchei A., Zamorani G., Zoubian J., Zucca E.

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=2020A&A...642A.192E (SIMBAD/NED BibCode)

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ADC_Keywords: Galaxy catalogs ; Galaxies, spectra ; Redshifts ; Galaxies, IR

Keywords: catalogs - surveys - cosmology: observations - galaxies: distances and redshifts

Abstract:

The Complete Calibration of the Colour-Redshift Relation survey (C3R2) is a spectroscopic effort involving ESO and Keck facilities designed specifically to empirically calibrate the galaxy colour-redshift relation - $P(z|C)$ to the Euclid depth ($i_{AB}=24.5$) and is intimately linked to the success of upcoming Stage IV dark energy missions based on weak lensing cosmology. The aim is to build a spectroscopic calibration sample that is as representative as possible of the galaxies of the Euclid weak lensing sample. In order to minimise the number of spectroscopic observations necessary to fill the gaps in current knowledge of the $P(z|C)$, self-organising map (SOM) representations of the galaxy colour space have been constructed. Here we present the first results of an ESO@VLT Large Programme approved in the context of C3R2, which makes use of the two VLT optical and near-infrared multi-object spectrographs, FORS2 and KMOS. This data release paper focuses on high-quality spectroscopic redshifts of high-redshift galaxies observed with the KMOS spectrograph in the near-infrared H- and K-bands. A total of 424 highly-reliable redshifts are measured in the $1.3 \leq z \leq 2.5$ range, with total success rates of 60.7% in the H-band and 32.8% in the K-band. The newly determined redshifts fill 55% of high (mainly regions with no spectroscopic measurements) and 35% of lower (regions with low-resolution/low-quality spectroscopic measurements) priority empty SOMgrid cells. We measured H fluxes in a 1.2" radius aperture from the spectra of the spectroscopically confirmed galaxies and converted them into star formation rates. In addition, we performed an SED fitting analysis on the same sample in order to derive stellar masses, $E(B-V)$, total magnitudes, and SFRs. We combine the results obtained from the spectra with those derived via SED fitting, and we show that the spectroscopic failures come from either weakly star-forming galaxies (at $z < 1.7$, i.e. in the H-band) or low S/N spectra (in the K-band) of $z > 2$ galaxies.

Description:

Spectroscopic redshifts assigned during a VLT/KMOS Large Programme (88h) in three extragalactic fields (COSMOS, VVDS, SXDF) as part of the spectroscopic calibration survey for weak lensing cosmological analysis (C3R2); the catalogue also contains relevant physical information regarding the observed targets, derived either using SED fitting analysis and spectral line analysis. The released catalogue collects 424 high-quality ($Q \geq 3$) redshift measurements.

The properties of a sub-sample of galaxies are given in Table 5 of the related manuscript.

File Summary:

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  FileName      Lrecl  Records  Explanations
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  ReadMe        80      .      This file
  table5.dat    127     413    Spectroscopic redshifts and physical
  parameters
                                     of the spectroscopically confirmed
  galaxies
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Byte-by-byte Description of file: table5.dat

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Bytes	Format	Units	Label	Explanations	
1-	6	I6	---	objID	Galaxy identification number
8-	16	F9.5	deg	RAdeg	Right ascension (J2000.0)
18-	25	F8.5	deg	DEdeg	Declinationn (J2000.0)
27-	52	A26	---	Pointing	KMOS OB where the galaxy was observed
54-	59	F6.4	---	zsp	Spectroscopic redshift assigned and validated
61-	63	F3.1	---	q_zsp	Quality flag of the redshift measurement (1)
65-	70	F6.4	---	zph	Photometric redshift in parent survey
72-	75	I4	---	Priority	Observational priority of target (M17)
77-	79	F3.1	mag	E(B-V)	Best E(B-V) from LePhare
81-	86	F6.2	[Msun]	b_logMass	?=-99 16th percentile of the stellar mass
88-	93	F6.2	[Msun]	logMass	?=-99 Median value of the stellar mass
95-	100	F6.2	[Msun]	B_logMass	?=-99 84th percentile of the stellar mass
102-	107	F6.2	[Msun/yr]	b_SFR	?=-99 16th percentile of the SFR
109-	114	F6.2	[Msun/yr]	SFR	?=-99 Median value of the SFR
116-	121	F6.2	[Msun/yr]	B_SFR	?=-99 84th percentile of the SFR
123-	127	F5.2	10-20W/m2	FHa	H{alpha} flux within 1.2" aperture

Note (1): Quality flag as follows:

4.0 = indicates a secure redshift measurement based on the identification of

more than one emission line. Specifically, the H{alpha} line is associated with the NII doublet at λ 6549.84{AA}, λ 6585.23{AA}. In one case, the OII doublet (λ 3727.09{AA} and λ 3729.88{AA}) was identified rather than the H{alpha} line.

3.5 = indicates a secure redshift measurement based on a single emission line (usually H{alpha})

3.0 = indicates a likely secure redshift determination, but with a low probability of an incorrect identification or an uncertain redshift due to low signal-to-noise data or sky-line contamination affecting the Gaussian fit

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References:

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 Euclid Coll., Paper VI 2020A&A...635A.139E

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