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Data Collection	VMC_EB
Release Number	1
Data Provider	Maria-Rosa Cioni
Date	03.09.2014

Abstract

Observations were obtained with the VISTA telescope as part of the VISTA survey of the Magellanic Cloud system (VMC; ESO program 179.B-2003) in three filters: Y, J and K_s. The main goals of the VMC survey are the determination of the spatially resolved star formation history and the three-dimensional geometry of the Magellanic system. The sensitivity of the data is designed to reach sources below the oldest main-sequence turn off point of the stellar population and the multi-epochs to measure accurate K_s mean magnitudes for pulsating variable stars, e.g. RR Lyrae stars and Cepheids.

This catalogue data release refers to Eclipsing Binary stars in five VMC tiles completed by October 2012 (Muraveva et al. 2014). These are tiles LMC 5_5, 6_4, 6_6, 8_3, and 8_8. VMC K_s magnitudes are listed together with periods from optical catalogues (OGLE-III, EROS-2) for each star. The total sky coverage of this release is ~7.5 deg² in the LMC, corresponding to the sum of the areas of the five tiles.

Overview of Observations

The figure below shows the Magellanic system as tiled by the VMC survey (blue) and tiles for which catalogues are released (red). Underlying small dots indicate the distribution of carbon stars, stellar clusters and associations.
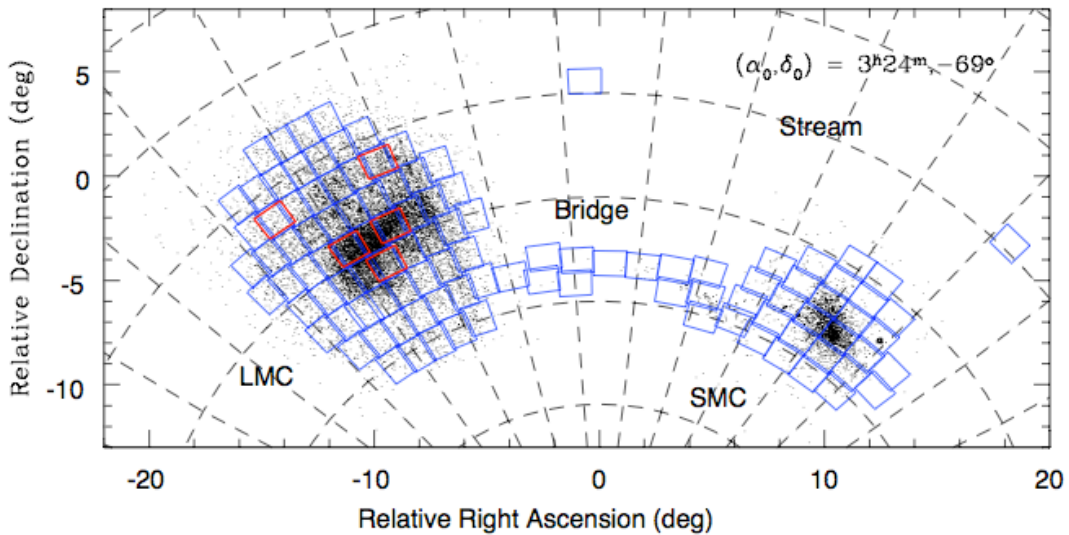
Tile numbering begins from the bottom right corner, increasing from right to left and from bottom to right. The first LMC tile is 2_3, the first SMC tile is 2_2, the first Bridge tile is 1_2 and Stream tile 1_1 is right above the Bridge while 2_1 is to the right of the SMC.

Release Content

This release covers five tiles in the Large Magellanic Cloud: LMC 5_5, 6_4, 6_6, 8_3, and 8_8.

LMC tiles were oriented with the Y axis more or less along the declination direction and cover about 1.771 deg^2 each where the central (1.475 x 1.017)=1.501 deg^2 corresponds to the nominal depth of the survey and the remaining area to half the exposure time in each band.

The Eclipsing Binary stars included in this release are initially extracted from the EROS-2 surveys. Only 70% of tile LMC 8_8 is covered by the EROS-2 and the variable stars in the remaining area of the tile have yet to be discovered.

Tile centres, number of records and the size in Mby are listed below.

Tile	RA	Dec	Records	Mby
LMC 5_5	05:24:30.336	-70:48:34.200	100	0.04
LMC 6_4	05:12:55.800	-69:16:39.360	187	0.05
LMC 6_6	05:37:40.008	-69:22:18.120	204	0.06
LMC 8_3	05:04:53.952	-66:15:29.880	63	0.03
LMC 8_8	05:59:23.136	-66:20:28.680	2	0.02

Release Notes

The data for this release were prepared by the Wide Field Astronomy Unit (WFAU) and the VMC team from images processed by the Cambridge Astronomy Survey Unit (CASU).

The main processing steps are described in Cross et al. 2012 (A&A 548, A119) and Cross et al. 2009 (MNRAS 399, 1730). Variability catalogues were extracted from the VISTA Science Archive by WFAU using data in the VMCv20130805 internal release. Full details are given in Muraveva et al. 2014 (MNRAS, 443, 432).

Data Reduction and Calibration

The procedures to reduce and calibrate the data are described in detail at:
http://casu.ast.cam.ac.uk/surveys-projects/vista/technical/data-processing.

In particular, catalogues were created from images that were filtered for nebulosity with size of the order of 30 arcsec (Irwin 2010, UKIRT Newsletter 26, 14).

The magnitudes were not corrected for reddening.

Data Quality

The astrometric and photometric quality of the data is described in detail at
http://casu.ast.cam.ac.uk/surveys-projects/vista/technical.

Known issues

None.

Data Format

Files Types

Five Eclipsing Binary catalogues, one per tile, are released:

vmc_er3_05h04-066d15_yjks_eclBinCat_558345748481.fits
vmc_er3_05h12-069d16_yjks_eclBinCat _558345748483.fits
vmc_er3_05h24-070d48_yjks_eclBinCat _558345748485.fits
vmc_er3_05h37-069d22_yjks_eclBinCat _558345748484.fits
vmc_er3_05h59-066d20_yjks_eclBinCat _558345748482.fits

where the name is constructed as project_release_ra/dec_bands_typeofCat_framesetID.fits
and framesetID uniquely identifies the tile as follows:

558345748481 LMC 8_3
558345748483 LMC 6_4
558345748485 LMC 5_5
558345748484 LMC 6_6
558345748482 LMC 8_8.

A MetaData file, vmc_er3_yjks_eclBinCatMetaData.fits, accompanies the release. Its name refers to project_release_bands_typeofCat.fits.

Catalogue Columns

Each known eclipsing binary catalogue contains the following columns.

Number; name; format; description
1; IAUNAME; 29A; Unique identifier in IAU naming convention
2; SOURCEID; K; UID of this merged detection as assigned by merged algorithm
3; VARID; K; UID of VMC variables
4; FIELDID; 8A; ID of field
5; CUEVENTID; J; UID of curation event giving rise to this record
6; CATALOGUE; 16A;Name of external catalogue containing the counterparts
7; EXTERNALID; 32A; Identification from EROS-2 or OGLE III catalogues
8; RA2000; D; Celestial Right Ascension
9; DEC2000; D; Celestial Declination
10; NEPOCHS; J; Number of epochs in the Ks band
11; KSMAX; Ks magnitude at maximum light, determined by fitting with GRATIS
12; KSMAXERR; Error on Ks magnitude at maximum light
13; PERIOD; E; Period from the external catalogue
14; EPOCHMIN; E; Epoch of minimum light (JD-2,400,000)
15; NOTES; 16A; EROS: "cont.-like", "non-contact"; OGLE: "checked" (by GRATIS), "n/c"
16; ORIGVSAREL; 16A; VSA release from which Ks data was used
17; ORIGVSASOURCEID; K; VSA sourceID in VSA release from which Ks data was used

The format refers to the fits notation as follows:
A - string 32 characters; D - double floating point (8 bytes); E - real floating point (4 bytes); I - short integer (2 bytes); J - integer (4 bytes); K - long integer (8 bytes).

Acknowledgements