Universe model ICD

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Document History

Issue	Revision	Date	Author	Comment
4	0	2008-02-08	CR	The light curve parameters for variable stars are not written anymore in the output file. They are now described in the document for each variability type.
4	1	2008-03-06	FA	Changed the format of identifiers, object types, and components to strings; for stars, first 3 fields are replaced by a 22-char String ID; for galaxies, quasars, star cluster, solar system objects, the first 2 fields are replaced by a Sting Id.
4	2	2008-04-25	CR	Changed the light curve for ACV variability type. f should be a random number between 0 and 1 but is fixed to 0.5 in this cycle.
5	0	2008-08-13	CR	f random for ACV variability type. Add semiregular and microlens variability types.
6	0	2009-01-13	CR	The parameter R_{env}/R_{star} is added for Be stars.
6	1	2009-01-13	CR	The spectral types are changed from float to string.
6	2	2009-03-10	CR	Dwarf nova and Microlens variability types added. Parameter f for ACV removed.
6	3	2009-03-16	CR	Parameters slope and EW added to characterize the quasars spectral type.
6	4	2009-03-31	CR	Boolean added to indicate is the star has spots or not. This changes the photocenter.
6	4	2009-04-01	CR	MDB input/output available.
7	0	2009-09-21	CR	Add planetary nebulae, HII regions, supernovae.
7	0	2009-12-4	CR	Spectral type and luminosity class are now one field (string).
9	0	2010-12-10	CR	MDB name fields added.
11	0	2012-01-11	CR	Change apparent magnitudes to mean apparent magnitudes.
11	0	2012-03-23	CB	Update QSO parameters.

Contents

1 Purpose

The Universe part of the Gaia simulator aims to provide a realistic distribution of any type of objects in the Universe, as seen by Gaia. It gives their position, velocities and physical parameters. This document describes the proposed format of the output file from the GaiaSimulator Universe. This file is used as an interface by Gaia data generators and may be used by other CUs packages. The Universe model overview is given in GAIA-C2-TN-LAOB-AR-004. The use of the Universe model is explained in the Gaiasimu Userguide (GAIA-C2-TN-OPM-FC-001).

Version: Universe model ICD of Cycle 11 version in agreement with GaiaSimu11.0

Origin: CU2

Source: Universe simulator

Destination: data generators (GIBIS, GASS, GOG) and other CUs.

2 General description

• ASCII file and gbin format (see section 6.5 in Main Database Interface Control Document GAIA-C1-SP-ESAC-JH-001 devoted to the Universe Model type definitions under the CU2)
• The ASCII file is generated by the class *writeICD.java* in the package *gaiasimu/universe/outputfile*. The gbin file is generated by the class *writeICDMDB.java*
• The ASCII file can be read by the class *readICD.java* in the same package as above, the gbin file by the class *readICDMDB.java*.
• One line in the output file describes one source
• A source is an independent system with a barycentre (and other global properties), it can

be either one object or a system with several components, resolved or not
• The system is described and then each components are described in a hierarchical way. As an example, a system of 3 stars, one of them having a planet around, is described by 6 lines, as shown in figure 1
• Each line contains several fields to describe the source. The fields depend on the type of source (star, asteroid, galaxy, etc). All fields are always present.
• Some parameters are written but not read (e.g. when they are observable, recomputed parameters which could happen to be not strictly identical internally). These parameters are overlined.

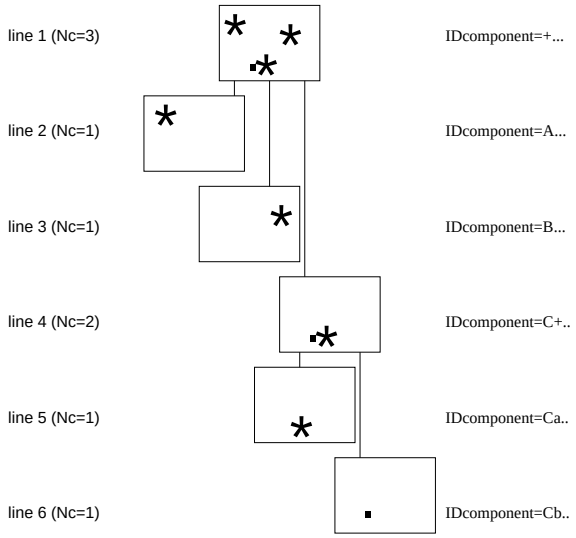

FIGURE 1: Representation of a stellar system. Star symbols represent stars, the dot represents an exoplanet. N_c is the number of components in the source. The components can be either a single object or a system, in which case the Id ends with the "+" sign.

3 Object types

3.1 Object identification

Each object is caracterised by a unique identifier, a 22 char String, describing the object type, the region where the object is, the object number in this region, the multiplicity (WDS type, see Fig. 1) or variability being indicated at the end of the identifier. The identifier and object type definition is indicated in Table 2 for Solar System Objects, in Table 1 for all other objects, a full description being given in GAIA-C2-SP-OPM-FA-049. Examples of identifier can be:

- G000123456-012345 : the galaxy number 12345 in region number 123456
- *000000455-000035Ab2V: variable star and component Ab2 in a 3-level system
- a000000123+ : the barycentre of a binary asteroid

TABLE 2: Identifier content and list of object types (not for SSO).

ID Field	Type	Range or BNF description
object type	1 char	$*\|E\|G\|S\|C\|Q\|H\|P$
region	int	0-268435455
number	int	0-262143
component	4 chars	7 comp., 4 hierar. levels max.
variability	1 char	$V\|\_$

Code	Object type
*	Stellar system, star, brown dwarf
G	Galaxies
Q	Quasars
S	Extragalactic supernova
E	Exoplanet
P	Planetary nebula
H	HII region
C	Open or globular cluster

TABLE 3: Identifier content and list of object types for SSO.

ID Field	Type	Range or BNF description
object type	1 char	$a\|c\|p\|s$
number or name	int or String	0-268435455 or [15 char max]
component	4 chars	7 comp., 4 hierar. levels max.

Code	Object type
a	asteroid
c	comet
p	planet
s	satellite

3.2 Stellar system, star, brown dwarf, exoplanet

Field name	UMStellarSource name	Type	Unit	range	Description
ID	sourceId	String	—	22 char	Object identification, see Table 1
N_c	nc	int	—	1:9	nb of components (a component can be either one object or a system)
N_t	nt	int	—	1:30	total number of objects (stars, brown dwarfs or exoplanets) in the system
Host	host	int	—	1:10	1=Milky Way, 2=SMC, 3=LMC, 4=M31, a complete list should be given
Astrometry, defined only for the first level object (IDcomponent=+ or null, see note #1):					
α	astrometry.alpha	double	dec. deg	0:360	right asc. of the barycentre at J2010 reference epoch in the ICRS frame
δ	astrometry.delta	double	dec. deg	-90:90	declination of the barycentre at J2010 reference epoch in the ICRS frame
Distance	astrometry.distance	double	pc	0:10^6	distance from the barycentre of the Solar System to the barycentre of the source at J2010 reference epoch
$\mu_\alpha * cos\delta$	astrometry.muAlpha	double	mas yr^{-1}	-3000:3000	proper motion along right ascension at J2010 reference epoch
μ_δ	astrometry.muDelta	double	mas yr^{-1}	-3000:3000	proper motion along declination at J2010 reference epoch
Radial velocity	astrometry.radialVelocity	double	km s^{-1}	-1000:1000	Radial velocity at J2010 reference epoch
Orbit, defined only for the components (IDcomponent=(B-G), see note #1):					
Period of orbit	orbitPeriod	double	day	0:10^7	
Periastron date	periastronDate	double	day	0:P	at J2010 reference epoch
Semi-major axis	semimajorAxis	double	AU	0:10^5	para/hyperbolic orbits will use perihelion distance instead
Eccentricity	eccentricity	double	—	0:1	
Arg. of Periastron	periastronArgument	double	deg	0:360	
Inclination	inclination	double	deg	0:90	
Long. of asc. node	longitudeAscendingNode	double	deg	0:360	
Phase	phase	double	—	0:1	for exoplanet only: angle Sun-satellite-exoplanet at J2010 reference epoch
Physical parameters (those of the primary if system):					
Flag-interacting	flagInteracting	int	—	0:1	defined only if source is a stellar system: 0=Keplerian motion, 1=interacting system, 2=mass exchange
Population	population	int	—	0:4	1=thin disc,2= thick disc,3= spheroid, 4=bulge
Age	age	double	Gyr	0:15	
[Fe/H]	feH	double	dex	-4:1	metallicity
$[\alpha$/Fe]	alphaFe	double	dex	-1:1	alpha elements abundance
A_V	photometry.Av	double	mag	0:60	interstellar absorption in the V-band
A_G	Ag	double	mag	0:60	interstellar absorption in the G-band
R_v	Rv	double	mag	0:60	extinction parameter (R_v = 3.1)
Physical parameters (or total physical parameters if $N_c \neq 1$):					
G	photometry.magG	double	mag	-3:60	mean apparent magnitude
G_{RP}	photometry.magGBp	double	mag	-3:60	mean apparent magnitude
G_{BP}	photometry.magGRp	double	mag	-3:60	mean apparent magnitude
G_{RVS}	photometry.magGRvs	double	mag	-3:60	mean apparent magnitude
$V-I$	colorVminusI	double	mag	-1:10	mean intrinsic V-I color
M_V	meanAbsoluteV	double	mag	-20:60	mean absolute V magnitude
$M_{\rm bol}$	mbol	double	mag	-20:60	mean absolute bolometric magnitude
Mass	mass	double	$M_\odot$	10^{-7}:10^2*N_t	
Complementary physical parameters for objects with $N_c = 1$:					
Radius	radius	double	$R_\odot$	0.001:100	radius (mean value for variable pulsating stars)
T	teff	double	K	10:10^5	effective temperature for stars, equilibrium temperature for exoplanets
log g	logg	double	dex	-2:10	gravity
SpT, lum. class	spectralType	string	—	—	for stars only, MK classification
$v \sin i$	vsini	double	km s^{-1}	0:1000	for stars only: v=equatorial velocity, i=angle between rotation axis and line of sight
R_{env}/R_{star}	rEnvRStar	double	—	1:7	Envelop characteristic parameter for Be stars
Bond-albedo	bondAlbedo	double	—	0:1	for exoplanet only: Bond albedo in the V band
Geom-albedo	geomAlbedo	double	—	0:1	for exoplanet only: geometric albedo in the V band
Variability (see note #2):					
Variability type	variabilityType	string	—		deltascuti, ACV, cepheid, RRab, RRc, roAp, semiregular, microlens, dwarfnovae, mira,Flaring, be, DYPer, RCrBs, 0 if no variability
Amplitude	no MDB	double	mag	0:30	amplitude in V magnitude
Period	no MDB	double	day	0:10^5	
Phase	no MDB	double	—	0:1	at J2010 reference epoch
Spot	no MDB	boolean	—	0:1	for stars only. 1 if the star has hotspot, 0 if not

Note #1:

Equatorial coordinates, distance and velocity are given for the first level source only. For the components below, an orbit described by 7 parameters is given instead. For the primary star of the system, the orbit is not given as it can be simply computed as the reflex motion.
For the source given in figure 1:
line 1 (stellar system): Equatorial coordinates, Velocity
line 2 (star): no orbit given
line 3 (star): orbit
line 4 (stellar system): orbit
line 5 (star): no orbit given
line 6 (extrasolar planet): orbit

Note #2:

The light curve of the variable stars are described in the Universe Model Overview GAIA-C2-TN-LAOB-AR-004

3.3 Solar system objects

- readICD not implemented
- Crossed-out parameters are not implemented
- binary (or multiple) objects not implemented

Field name	Type	Unit	range	Description	
ID	sourceExtendedId	String	—	(22 char)	Object identification, see Table 2
~~IDmain~~	no MDB	int	—	1:10^{20}	For satellites: ID of the main body
~~Population~~	no MDB	int	—	1:10	1=Planet, 2=Main Belt Asteroid, 3=comet, 4=TNO, 5=Centaur 6=Trojan (to be validated).
Orbit	no MDB				Heliocentric orbit of the system barycentre if type=3000, of the satellite relative to main body if type=3002, no orbit given for type=3001 (for planets: 1=ecliptic, mean equinox J2000.0)
~~Period of orbit P~~	no MDB	double	yr	0:10^7	
~~Perihelion distance~~	perihelion	double	AU	0:100	Used only for para-/hyper-bolic orbits
Semi-major axis	SemiMajorAxis	double	AU	0:10^5	
Eccentricity	eccentricity	double	—	0:1	
Periastron argument	no MDB	double	rad	0:π	
Inclination	inclination	double	rad	0:π	
Longitude of ascending node	gOmega	double	rad	0:2π	
Mean anomaly	M	double	rad	0:2π	at J2010 reference epoch
Physical parameters if single object (or total physical parameters if $N_c \neq 1$):					
H	H	double	mag	-10:60	absolute magnitude in the V band, at 1AU from Sun and Earth, phase=0 deg
$V-I$	no MDB	double	mag	-1:10	
Mass	mass	double	kg	10^{10}:10^{27}	
Complementary physical parameters for single objects:					
Shape	no MDB				
a	no MDB	double	km	0:10^5	Axis of the ellipsoid best describing the shape
b	no MDB	double	km	0:10^5	
c	no MDB	double	km	0:10^5	
Rotation	no MDB				
β	no MDB	double	deg	-90:90	Ecliptic coordinates of the rotation pole: latitude
λ	no MDB	double	deg	0:360	longitude
Spin sidereal period	no MDB	double	hours	0:10^3	spin period
Origin of rotation	no MDB	double	deg	0:360	planetocentric Sub-solar longitude at reference epoch

3.4 Galaxies

Crossed-out parameters are not implemented yet

Field name	Type	Unit	range	Description	
ID	sourceExtendedId	String	—	(22 char)	Object identification, see Table 1
α	astrometry.alpha	double	decimal deg	0:360	right asc. of the barycentre at J2010 reference epoch in the ICRS frame
δ	astrometry.delta	double	decimal deg	-90:90	declination of the barycentre at J2010 reference epoch in the ICRS frame
$\mu_\alpha * cos\delta$	astrometry.muAlpha	double	mas yr^{-1}	-100:100	proper motion along right ascension at J2010 reference epoch
μ_δ	astrometry.muDelta	double	mas yr^{-1}	-100:100	proper motion along declination at J2010 reference epoch
Radial velocity	astrometry.radialVelocity	double	km s^{-1}	-10^6:10^6	Radial velocity at J2010 reference epoch
Redshift	redShift	double	—	0:7	
~~Distance~~	astrometry.distance	double	Mpc	0:10^4	heliocentric distance of the barycentre
A_V	photometry.Av	double	mag	0:60	Interstellar absorption in the V-band
R_v	Rv	double	mag	0:60	extinction parameter ($R_v = 3.1$)
G	photometry.magG	double	mag	-3:60	mean apparent magnitude
G_{RP}	photometry.magGRp	double	mag	-3:60	mean apparent magnitude
G_{BP}	photometry.magGBp	double	mag	-3:60	mean apparent magnitude
G_{RVS}	photometry.magGRvs	double	mag	-3:60	mean apparent magnitude
V	meanAbsoluteV	double	mag	-1:10	intrinsic apparent V magnitude
$V - I$	colorVminusI	double	mag	-1:10	intrinsic V-I color
Hubble type	hubbleType	string	—		E2, E-S0, Sa, Sb, Sbc, Sc, Sd, Im, QSFG
Shape	shape	string	—	—	follows SkyMaker format with parameters separated wtih ","
SNId	no MDB	string	—	(22 char)	ID of supernova, if exists
~~morphological type~~	no MDB	int	—	1:4	four classes of spectra for ellipticals, spirals, irregulars and starbusts
~~P1~~	no MDB	double			exponent of the star formation rate law
~~P2~~	no MDB	double			coefficient of the star formation rate law
~~t(1)~~	no MDB	double	Gyr	0:15	time since the star formation rate stopped
~~t(2)~~	no MDB	double	Gyr	0:15	infall timescale
~~t~~	no MDB	double	Gyr	0:15	age
~~M~~	no MDB	double	$M_\odot$		normalized mass of the galaxy
~~M(stars)~~	no MDB	double	$M_\odot$		normalized mass in stars
~~M(wd)~~	no MDB	double	$M_\odot$		normalized mass in white dwarfs
~~M(NBH)~~	no MDB	double	$M_\odot$		normalized mass in neutron stars and black holes
~~M(subS)~~	no MDB	double	$M_\odot$		normalized mass in substellar objects
~~M(gas)~~	no MDB	double	$M_\odot$		normalized mass in the gas
~~Z(ISM)~~	no MDB	double			metallicity of the interstellar medium (mass fraction)
~~Z (average)~~	no MDB	double			mean metallicity of stars averaged on the mass (i.e., the mean initial metallicity of the stars still alive averaged on their initial mass)
~~Z (average Mbol)~~	no MDB	double			mean metallicity of stars averaged on the bolometric luminosity
~~Mbol~~	no MDB	double	erg s^{-1}		normalized bolometric luminosity
~~τ~~	no MDB	double			optical depth in the V-band (5500$\AA$) from side to side (through the center for the spheroidal geometry and along the axis of rotational symmetry for the disk geometry)
~~L(dust)/Mbol~~	no MDB	double	—	0:1	ratio of the luminosity emitted by the dust to the bolometric luminosity
~~SFR~~	no MDB	double	$M_\odot$/Myr		normalized star formation rate [†]
~~N(phot)~~	no MDB	double	s^{-1}		normalized number of Lyman continuum photons emitted
~~SNII~~	no MDB	double	Myr^{-1}		normalized SNII rate
~~SNIIa~~	no MDB	double	Myr^{-1}		normalized SNIa rate
~~t (stars)~~	no MDB	double	Gyr	0:15	mean age of the stars averaged on the mass (Myr)
~~t (averaged)~~	no MDB	double	GMyr	0:15	mean age of stars averaged on the bolometric luminosity

3.5 Quasars

Crossed-out parameters are not implemented yet.

Field name	Type	Unit	range	Description	
ID	sourceExtendedId	String	—	(22 char)	Object identification, see Table 1
α	astrometry.alpha	double	decimal deg	0:360	right ascension of the barycentre at J2010 reference epoch in the ICRS frame
δ	astrometry.delta	double	decimal deg	-90:90	declination of the barycentre at J2010 reference epoch in the ICRS frame
$\mu_\alpha * cos\delta$	astrometry.muAlpha	double	mas yr^{-1}	-100:100	proper motion along right ascension at J2010 reference epoch
μ_δ	astrometry.muDelta	double	mas yr^{-1}	-100:100	proper motion along declination at J2010 reference epoch
Radial velocity	astrometry.radialVelocity	double	km s^{-1}	-10^{10}:10^{10}	Radial velocity at J2010 reference epoch
Redshift	redShift	double	—	0:6	
A_V	Av	double	mag	0:60	Interstellar absorption in the V-band
R_v	Rv	double	mag	0:60	extinction parameter ($R_v = 3.1$)
G	photometry.magG	double	mag	-3:60	mean apparent magnitude
G_{RP}	photometry.magGRp	double	mag	-3:60	mean apparent magnitude
G_{BP}	photometry.magGBp	double	mag	-3:60	mean apparent magnitude
G_{RVS}	photometry.magGRvs	double	mag	-3:60	mean apparent magnitude
~~$V-I$~~	no MDB	double	mag	-1:10	intrinsic V-I color
~~M_{bol}~~	no MDB	double	mag	-35:-20	bolometric absolute magnitude
Spectral type	No MDB				define by three parameters
slope	slope	double	—	-4:2	continuum
EW	w	double	Å	0:100000	total equivalent width of the emission lines
~~AI~~	No MDB				(internal) absorption index

3.6 Supernovae

Field name	Type	Unit	range	Description	
ID	sourceExtendedId	String	—	(22 char)	Object identification, see Table 1
α	astrometry.alpha	double	decimal deg	0:360	right ascension of the barycentre at J2010 reference epoch in the ICRS frame
δ	astrometry.delta	double	decimal deg	-90:90	declination of the barycentre at J2010 reference epoch in the ICRS frame
Distance	astrometry.distance	double	Mpc	0:10^4	heliocentric distance of the barycentre
$\mu_\alpha * cos\delta$	astrometry.muAlpha	double	mas yr^{-1}	-100:100	proper motion along right ascension at J2010 reference epoch
μ_δ	astrometry.muDelta	double	mas yr^{-1}	-100:100	proper motion along declination at J2010 reference epoch
Radial velocity	astrometry.radialVelocity	double	km s^{-1}	-10^6:10^6	Radial velocity at J2010 reference epoch
Redshift	redShift	double	—	0:7	
A_V	photometry.Av	double	mag	0:60	Interstellar absorption in the V-band
R_v	Rv	double	mag	0:60	extinction parameter ($R_v = 3.1$)
G	photometry.magG	double	mag	-3:60	mean apparent magnitude
G_{RP}	photometry.magGRp	double	mag	-3:60	mean apparent magnitude
G_{BP}	photometry.magGBp	double	mag	-3:60	mean apparent magnitude
G_{RVS}	photometry.magGRvs	double	mag	-3:60	mean apparent magnitude
V	V	double	mag	-1:10	intrinsic apparent V magnitude
$V-I$	colorVminusI	double	mag	-1:10	intrinsic V-I color
M_V	meanAbsoluteV	double	mag	-20:60	mean absolute V magnitude
Type	type	string	—		Ia, Ib/c, II-L, II-P

3.7 HII regions

Field name	Type	Unit	range	Description	
ID	sourceExtendedId	String	—	(22 char)	Object identification, see Table 1
α	astrometry.alpha	double	decimal deg	0:360	right ascension of the barycentre at J2010 reference epoch in the ICRS frame
δ	astrometry.delta	double	decimal deg	-90:90	declination of the barycentre at J2010 reference epoch in the ICRS frame
Distance	astrometry.distance	double	pc	$0{:}10^6$	heliocentric distance of the barycentre
$\mu_\alpha * cos\delta$	astrometry.muAlpha	double	mas yr^{-1}	-100:100	proper motion along right ascension at J2010 reference epoch
μ_δ	astrometry.muDelta	double	mas yr^{-1}	-100:100	proper motion along declination at J2010 reference epoch
Radial velocity	astrometry.radialVelocity	double	km s^{-1}	$-10^6{:}10^6$	Radial velocity at J2010 reference epoch
A_V	photometry.Av	double	mag	0:60	Interstellar absorption in the V-band
R_v	Rv	double	mag	0:60	extinction parameter ($R_v = 3.1$)
G	photometry.magG	double	mag	-3:60	mean apparent magnitude
G_{RP}	photometry.magGRp	double	mag	-3:60	mean apparent magnitude
G_{BP}	photometry.magGBp	double	mag	-3:60	mean apparent magnitude
G_{RVS}	photometry.magGRvs	double	mag	-3:60	mean apparent magnitude
V	V	double	mag	-1:10	intrinsic apparent V magnitude
$V - I$	colorVminusI	double	mag	-1:10	intrinsic V-I color
M_V	meanAbsoluteV	double	mag	-20:60	mean absolute V magnitude
Size	size	double	arcmin	0:120	apparent size

3.8 Planetary nebulae

Planetary nebulae are linked to a star. The astrometry is the one of the parent star.

Field name	Type	Unit	range	Description	
ID	sourceExtendedId	String	—	(22 char)	Object identification, see Table 1
α	astrometry.alpha	double	decimal deg	0:360	right ascension of the barycentre at J2010 reference epoch in the ICRS frame
δ	astrometry.delta	double	decimal deg	-90:90	declination of the barycentre at J2010 reference epoch in the ICRS frame
$\mu_\alpha * cos\delta$	astrometry.muAlpha	double	mas yr^{-1}	-100:100	proper motion along right ascension at J2010 reference epoch
μ_δ	astrometry.muDelta	double	mas yr^{-1}	-100:100	proper motion along declination at J2010 reference epoch
Radial velocity	astrometry.radialVelocity	double	km s^{-1}	$-10^6{:}10^6$	Radial velocity at J2010 reference epoch
A_V	photometry.Av	double	mag	0:60	Interstellar absorption in the V-band
R_v	Rv	double	mag	0:60	extinction parameter ($R_v = 3.1$)
G	photometry.magG	double	mag	-3:60	mean apparent magnitude
G_{RP}	photometry.magRP	double	mag	-3:60	mean apparent magnitude
G_{BP}	photometry.magBP	double	mag	-3:60	mean apparent magnitude
G_{RVS}	photometry.magRVS	double	mag	-3:60	mean apparent magnitude
Real size	size	double	pc	0:1	
Apparent size	apparentSize	double	arcsec	0:3600	
Type	type	int		0:2	0=round, 1=elliptical, 2=bipolar
Distance	astrometry.distance	double	pc	$0{:}10^6$	heliocentric distance of the barycentre
Image	image	string			path to the file containing the image. Test image at the moment

3.9 Star cluster

Not implemented yet

Field name	Type	Unit	range	Description	
ID	MDB-field	String	—	(22 char)	Object identification, see Table 1
Object type	MDB-field	int	—		to be defined (e.g. star association, open cluster, globular cluster)
Host	MDB-field	int	—	1:10	1=Milky Way, 2=SMC, 3=LMC, 4=M31, a complete list should be given
α	MDB-field	double	decimal deg	0:360	right ascension of the barycentre at J2010 ref. epoch in the ICRS frame
δ	MDB-field	double	decimal deg	-90:90	declination of the barycentre at J2010 ref. epoch in the ICRS frame
$\mu_\alpha * cos\delta$	MDB-field	double	mas yr^{-1}	-2000:2000	proper motion along right ascension at J2010 reference epoch
μ_δ	MDB-field	double	mas yr^{-1}	-2000:2000	proper motion along declination at J2010 reference epoch
Radial velocity	MDB-field	double	km s^{-1}	-1000:1000	Radial velocity at J2010 reference epoch
Distance	MDB-field	double	pc	0:10^6	heliocentric distance of the barycentre
Population	MDB-field	int	—	0:4	0=thin disc,1= thick disc,2= spheroid, 3=bulge
Luminosity function	MDB-field				
Density law	MDB-field				
N_c	MDB-field	int	—	1:9	number of components
Age	MDB-field	double	Gyr	1:15	globular: King law, with a core radius and a tidal radius
[Fe/H]	MDB-field	double	dex	-4:1	metallicity
[α/Fe]	MDB-field	double	dex	-1:1	alpha elements abundance
A_V	MDB-field	double	mag	0:60	Interstellar absorption in the V-band
G	MDB-field	double	mag	-3:60	mean apparent magnitude
G_{RP}	MDB-field	double	mag	-3:60	mean apparent magnitude
G_{BP}	MDB-field	double	mag	-3:60	mean apparent magnitude
G_{RVS}	MDB-field	double	mag	-3:60	mean apparent magnitude
$V-I$	MDB-field	double	mag	-1:10	
M_{bol}	MDB-field	double	mag	-20:60	absolute bolometric magnitude
Mass	MDB-field	double	$M_\odot$	0.001:100*N_c	
Radius	MDB-field	double	pc	1:1000	
Shape	MDB-field	double()	—		parametrisation of the shape for open clusters