TIC v8.2 and CTL v8.xx Data Release Notes

This is the most recent version of the TESS Input Catalog and is the one available in MAST interfaces.

TIC Papers	TIC Versions 5-7: Stassun et al. 2018	TIC Version 8: Stassun et al. 2019	TIC Versions 8.1-8.2: Paegert et al. 2021

Introduction

These release notes describe the schema and content of the eighth version of the TESS Input Catalog (TICv8) produced entirely by the Target Selection Working Group (TSWG). TICv8 was finalized and prepared for delivery to the TESS Science Office (TSO) on 2019 April 15. Updates to TIC v8 were posted in July 2020 (TIC v8.1) and September 2021 (TIC v8.2): details are given below.

TICv8 has several minor issues (see below) that have not been fixed in this version due to time constraints during preparation. Specific details of the production method, and the contents of TICv8, are described on the arXiv (Stassun et al. (2019); https://arxiv.org/pdf/1905.10694.pdf). The complete documentation for TICv7, and earlier TIC versions, can currently be found in Stassun et al. (2018, AJ, 156, 102) and on the arXiv at (https://arxiv.org/abs/1706.00495).

The design of TICv8 is nearly identical to TICv7 in that the original columns and their formats are the same; however, there have been updates to various parameter calculations, and additional columns have been included to allow for more user flexibility. The TIC IDs have not been changed, and all future deliveries of the TIC will use the same TIC IDs for specific objects, preserving backward compatibility. New objects added to the TIC will *always* receive new IDs. Objects found to be spurious will be marked with a disposition of ARTIFACT, but will retain their TIC ID and remain in the catalog. TIC IDs will always be unique, and a new TIC object will never receive the ID of an existing TIC object.

Document Update History

This document should be considered a 'living document,' which will be updated as issues are identified or as descriptions are made more accurate. The update history for this document is:

- 2018 August: original release
- 2020 July: update for TIC v8.1, which identified ~700 targets with new dispositions, and CTL v8.1
- 2021 September: update for TIC v8.2

Major changes in TICv8 compared to TICv7

TICv8 contains major changes in computed quantities compared to TICv7 (cf. Stassun et al (2019)). It should be noted that the methods used to estimate a variety of stellar parameters are still under active development, and can be affected by poor catalog photometry when there is no acceptable alternative photometry for a given star.

The major changes in TIC v8 compared to TIC v7 are:

1. The base catalog for TICv8 is the Gaia DR2 catalog. This differs from the previous versions of the TIC, which were based on 2MASS. 2MASS and Gaia DR2 objects were matched using the Gaia-provided 2MASS-to-Gaia look-up table (tmass_best_neighbour). All 2MASS objects retained their original TICv7 TIC ID. All Gaia objects not found in 2MASS, or earlier versions of the TIC were given new TIC IDs.
2. Stars identified in 2MASS as a single source, but identified in Gaia as multiple sources, are identified with the disposition = SPLIT (column 86). In this case, the 2MASS object remains in the TIC with the original TIC ID, and two or more new sources are added to the TIC with new TIC IDs. In these cases, the new TIC objects will have the TIC ID of the original object in the duplicate_id column (column 87).
3. In all cases, physical parameters have been calculated using the reported effective temperature (column 65), radius (column 71), and mass (column 73) in the TIC. This includes stars that may have measured physical parameters, such as log(g) (column 67), in spectroscopic catalogs matched to TICv8. The only stellar parameters that have been adopted directly from spectroscopic catalogs are effective temperatures (column 65) and metallicities (column 69), provided the error on the effective temperature (column 66) is less than 300 K.
4. When multiple spectroscopic parameters exist for a single star in a single catalog, these values have been combined using a weighted mean.
5. The coordinates (columns 14,15, 25-28) and their uncertainties (columns 117-118) are provided in epoch 2000 due to mission requirements. Positional errors (columns 117-118) and proper motion errors (columns 18, 20) have been propagated. It should be noted that this leads to much larger errors than those in the nominal Gaia DR2 positions. Especially for Gaia DR2 stars, users should not try to propagate forward the TIC coordinates (columns 14, 15) using the proper motions (columns 17, 19) listed. Instead, users should use the original Gaia DR2 positions (columns 119, 120), proper motions (columns 14, 15), and corresponding errors for propagation (columns 121, 122). We provide RA and Dec, with errors, as given in the source catalog (Gaia DR2, 2MASS, etc.) in additional columns (119 - 122).
6. Many stars in the TIC have stellar parameters provided, regardless of their inclusion in the CTL. However, stars have their masses (column 73) calculated *only* if they have radii (column 71) smaller than the line shown in figure 10 of Stassun et al. (2019). This was to avoid providing masses for stars that may be giants using an empirical relation valid only for dwarf stars. If a star is identified as a subgiant, the mass (column 71) and log(g) (column 67) should not be considered to be reliable; however, the luminosity (column 78) and effective temperature (column 65) for these stars are considered to be reliable.
7. Several additional columns have been provided for users on MAST; see columns 89-122 below.
8. The Tmag (column 61) is now calculated using colors that have been corrected for reddening. Gaia colors are preferred if they are given and match the Gaia quality criteria (gaiaqflag = 1, column 112). As a result, some stars may have different Tmags compared to previous versions of the TIC.

9. The cool dwarf list was updated in TICv8 to only include cool dwarfs with reliable parallaxes (< 20% error). Stars in the previous version of the cool dwarf catalog retain their TICv7 stellar parameters, but no longer have a priority calculated.
10. The only stars from the specially curated cool dwarf list included in CTLv8.01 are those with T<16. This was done to limit the size of CTLv8. 01 to less than 10 million stars. Future versions of the CTL may include fainter cool dwarf stars.

Updates to the TICv8 CTL

This section of the release notes highlights major changes to how stars are selected for the TICv8 CTL as new versions of the CTL are generated.

The current version of the CTLv8.01, and is the original CTL for TICv8.

1. Stars are selected to be in the CTL if they meet the following requirements: Tmag < 13 (column 61), the Gaia quality flag is set to 1 (column 112), the star has a dwarf-like radius (the star's radius is smaller than the line in figure 10 of the full documentation), and the star's placement on the absolute Gmag (based on column 59) vs. gaiabp (column 108) - gaiarp (column 110) color-magnitude diagram suggests the star is *not* a white dwarf. Please see section 3.1 of the Stassun et al. (2019) for more details.
2. There is no longer a specially curated 'Bright Star' list, since there is now a separate brighter star CTL. As a result, stars no longer have their priorities set to be 1 if their *TESS* magnitude is brighter than Tmag = 6 (column 61). Thus 'Bright stars' are no longer automatically added to the exoCTL.
3. There is no longer a specially curated 'Known-Planets' list. The stellar parameters for such objects in existing catalogs were found to be too inhomogeneous to properly calculate a priority. Thus known planet hosts are no longer automatically added to the CTL.
4. CTL stars with calculated masses and radii that result in an unphysical value of log(g) > 5 (column 67) have had their CTL priorities set to 0. This was done to avoid prioritizing stars that may have poorly measured effective temperatures (column 65), extinction values (column 82) , and/or parallaxes (column 22), but that still pass the quality assurance cuts. Stars in specially curated lists have been excluded from this criterion.
5. Stars in the CTL have their priorities (column 88) multiplied by a factor of 0.1 if they are within 10 degrees of the Galactic plane (column 26). This was done to avoid prioritizing stars for two-minute cadence, which may be affected by large amounts of extinction. This is a change from the previous version of the TIC that de-boosted priorities if |b| < 15 degrees.
6. The only stars from the specially curated cool dwarf list which are included in CTLv8.01 are those with T<16. This was done to limit the size of CTLv8.01 to less than 10 million stars. Future versions of the CTL may include fainter cool dwarf stars.

Currently known quirks and issues with TICv8, versions 8.1 and 8.2

General Issues

There are a number of minor issues and quirks which have been identified by the TSWG. Users should read this section carefully before accepting TIC quantities at face value.

1. Some stars may have reported stellar parameter errors that are larger than the parameter quantity. Users are cautioned against using these parameters in calculations for publications.
2. Users are reminded that stars that have ecliptic latitudes between -6 and 6 degrees have their priorities set to zero. This "gap" in priority is meant to mimic the expected gap in camera coverage for the two-year primary TESS mission.
3. Some stars in the hot subdwarf list do not have errors for their stellar parameters. These were adopted 'as-is' for consistency.
4. The disposition column identifies objects that are included in the TIC, but are likely spurious, or related to other TIC objects in a non-trivial, non-astrophysical way. Currently, this column is populated as a NULL, DUPLICATE (6), ARTIFACT (7), or SPLIT (8). See section on Updates, below.
5. Users should note the metallicity (column 69) has been adopted when available from a spectroscopic catalog, but it is not directly used in any calculation. This may result in physical parameters that are not strictly consistent with the reported metallicity.
6. The listed RA (column 14) and Dec (column 15) are *not* measured positions, but positions which have been propagated to EPOCH J2000.0. Users should not try to propagate forward the TIC coordinates using the proper motions listed. Instead, users should use the original catalog position (column 119 & 120), proper motions (columns 17 & 19), and corresponding errors for propagation.
7. If a star is identified as a subgiant, and a mass and log(g) are provided, users should not consider these parameters to be reliable, because the empirical relations designed to calculate the mass are valid for dwarf stars. However the luminosity and effective temperature should be accurate.
8. Asymmetric errors are computed using a Monte Carlo method and are only provided for CTL stars which are not in a specially curated list. There are borderline cases where the peak of the property-distribution was too close to the validity-limit of the property-relation in order to compute reliable errors. These stars will have no or asymmetric errors for just some properties.
9. Negative errors for some Bmag and Vmag uncertainties: there are 40354 stars with negative Vmag uncertainties and 4395461 stars with negative Bmag uncertainties. The negative error values are all for stars from APASS DR9, and are magnitudes for which only one observation is used, and therefore are Poisson errors rather than standard deviation. When constructing the TIC, these negative values were not caught and converted into positive values, and thus are recorded as negative values in TIC8. Users should feel free to convert them to positive values and use them as a valid estimate of the uncertainty.
10. Negative E(B-V) values: there are two different origins for negative uncertainties in the "eneg_EBV" and "epos_EBV" columns. In the first case, if "EBVFlag" = 'schlegel' they are simple numerical and conversion errors between double and single precision values. These uncertainty values actually should be assumed to be 0.0. There are approximately 2.5 million stars in this group. If "EBVFlag" = 'panstarrs' the negative values originate from former CTL targets that got a negative value from the Monte Carlo method that was not restored properly. In these cases, the value is assumed to be NULL, e.g., the negative value does not have any useful meaning.

Updates to TIC 8 (v8.1 and v8.2)

TIC v8 was updated twice (2020 April (v8.1) and 2021 July (v8.2)) to identify objects that are included in the TIC, but are actually spurious objects or related to other TIC stars in a non-trivial, non-astrophysical way. The general categories for these objects are "split", "join", and "artifact", which are described below. Changes to the affected objects are reflected in the "disposition" (column 86) and/or "duplicate ID" (column 87) fields of their TIC entries.

The TIC 8.1 release changed the dispositions of ~700 stars that were targets in TESS Year 1 observations. The TIC 8.2 release was generated from a systematic analysis of TIC 8.1. The search for artifacts around target stars was limited to stars brighter than Tmag = 13. The search for duplicates and splits was not limited by magnitude, but by the origin of target stars: only 2MASS stars unmatched to Gaia DR2 were searched for duplicates and splits. In total about 34 million stars were updated.

The description below is an overview of the updates for TIC 8.2. For a complete discussion of the TIC 8.1 and 8.2 updates, please refer to Paegert et al. (2021) (https://arxiv.org/pdf/2108.04778.pdf): Section 3.1.1 deals with artifacts, Section 3.1.2 covers joins, and Section 3.1.3 describes splits.

SPLIT stars

In the case of a SPLIT, a star originating from TIC7 is actually an unresolved double- or multiple-star in 2MASS and has at least two entries in Gaia DR2 that did not get matched up properly in TIC8. In this case, the TIC 7 star is not a real star, and thus all magnitudes (Tmag, Vmag, J, H, K, etc.) and stellar properties (Teff, radius, mass, etc.) of the TIC 7 star are most likely corrupted in TIC 8 and should NOT be used. TIC 8.2 fixes the problem by copying the coordinates, TESS magnitude, and stellar characteristics of the brightest Gaia star over to the TIC ID of the corrupted star and then setting the disposition of the brightest Gaia star to DUPLICATE to indicate that it not real and should be ignored. (It is important to note that observed magnitudes, such as the 2MASS JHK, are not corrected and care should be taken before using them in any calculations). The disposition field of the corrected star is set to SPLIT, and the duplicate ID field of the brightest Gaia star is set to the TIC ID of the corrected star. The duplicate ID field of any other stars resolved by Gaia DR2 and associated with the corrected star is set to the TIC ID of the corrected star: the stellar parameters of these stars are valid, as they come from Gaia DR2, and remain unchanged.

The impact on photometry of stars misidentified in TIC 7 depends on the fluxes of the Gaia DR2 stars into which it was resolved, as well as the fluxes of nearby stars.

JOINs

Joins are stars originating from TIC 7 that did not get matched up with a Gaia DR2 star in TIC 8, meaning there are two entries in the TIC referring to the same star. In these cases, one of the stars is given the disposition DUPLICATE to indicate that it is not a real star, and the duplicate ID field is set to the TIC ID of the other star. To preserve backward compatibility, the ID of the TIC 7 star is preserved (i.e. its disposition is unchanged from NULL), and the Gaia star is given the disposition DUPLICATE. The stellar parameters of the TIC 7 star are updated using the improved, Gaia-derived values unless it is a star from a specially curated list, in which case the parameters are taken from those curated lists.

ARTIFACTs

Artifacts are generally spurious “stars” found by extracting sources from the original catalog source images and are often the result of diffraction spikes near bright stars, or other instrumental artifacts mistakenly interpreted as stars. The 2MASS entries of TIC 8 were searched for such spurious images. The disposition of TIC entries that have been identified as ARTIFACTs is set to ARTIFACT, indicating that the entry is not a real star.

TIC v8.2 Column Schema - Executive Summary

Column Number	Column Name	Data Type	Description	Units
1	ID	long	TESS Input Catalog identifier	
2	Version	string	Version Identifier for this entry	yyyy mmdd
3	HIP	long	Hipparcos Identifier	
4	TYC	string	Tycho2 Identifier	
5	UCAC	string	UCAC4 Identifier	
6	TWOMASS	string	2MASS Identifier	
7	SDSS	string	SDSS DR9 Identifier	
8	ALLWISE	string	ALLWISE Identifier	
9	GAIA	string	GAIA Identifier	
10	APASS	string	APASS Identifier	
11	KIC	long	KIC Identifier	
12	Objtype	string	Object Type	
13	Typesrc	string	Source of the object	
14	RA	double	Right Ascension epoch 2000	deg
15	Dec	double	Declination epoch 2000	deg
16	Posflag	string	Source of the position	
17	pmRA	double	Proper Motion in Right Ascension	mas /yr
18	e_pmRA	double	Uncertainty in PM Right Ascension	mas /yr

19	pmDec	double	Proper Motion in Declination	mas /yr
20	e_pmDec	double	Uncertainty in PM Declination	mas /yr
21	PMFlag	string	Source of the Proper Motion	
22	plx	double	Parallax	mas
23	e_plx	double	Error in the parallax	mas
24	PARFlag	string	Source of the parallax	
25	GalLong	double	Galactic Longitude	deg
26	GalLat	double	Galactic Latitude	deg
27	EcLong	double	Ecliptic Longitude	deg
28	EcLat	double	Ecliptic Latitude	deg
29	Bmag	float	Johnson B	mag
30	e_Bmag	float	Uncertainty in Johnson B	mag
31	Vmag	float	Johnson V	mag
32	e_Vmag	float	Uncertainty in Johnson V	mag
33	umag	float	Sloan u	mag
34	e_umag	float	Uncertainty in Sloan u	mag
35	gmag	float	Sloan g	mag
36	e_gmag	float	Uncertainty in Sloan g	mag
37	rmag	float	Sloan r	mag
38	e_rmag	float	Uncertainty in Sloan r	mag
39	imag	float	Sloan I	mag
40	e_imag	float	Uncertainty in Sloan I	mag
41	zmag	float	Sloan z	mag
42	e_zmag	float	Uncertainty in Sloan z	mag
43	Jmag	float	2MASS J	mag
44	e_Jmag	float	Uncertainty in 2MASS J	mag
45	Hmag	float	2MASS H	mag
46	e_Hmag	float	Uncertainty in 2MASS H	mag
47	Kmag	float	2MASS K	mag
48	e_Kmag	float	Uncertainty in 2MASS K	mag
49	TWOMflag	string	Quality Flags for 2MASS	
50	prox	float	Distance to 2MASS nearest neighbor	arcsec
51	W1Mag	float	WISE W1	mag
52	e_W1Mag	float	Uncertainty in WISE W1	mag
53	W2Mag	float	WISE W2	mag
54	e_W2Mag	float	Uncertainty in WISE W2	mag
55	W3Mag	float	WISE W3	mag
56	e_W3Mag	float	Uncertainty in WISE W3	mag
57	W4mag	float	WISE W4	mag
58	e_W4Mag	float	Uncertainty in WISE W4	mag
59	Gmag	float	GAIA G Mag	mag
60	e_Gmag	float	Uncertainty in GAIA G	mag
61	Tmag	float	TESS Magnitude	mag
62	e_Tmag	float	Uncertainty in TESS Magnitude	mag
63	TESSFlag	string	TESS Magnitude Flag	
64	SPFlag	string	Stellar Properties Flag	

65	Teff	float	Effective Temperature	K
66	e_Teff	float	Uncertainty in Effective Temperature	K
67	logg	float	log of the Surface Gravity	cgs
68	e_logg	float	Uncertainty in Surface Gravity	cgs
69	M/H	float	Metallicity	dex
70	e_M/H	float	Uncertainty in the Metallicity	dex
71	Rad	float	Radius	solar
72	e_Rad	float	Uncertainty in the Radius	solar
73	Mass	float	Mass	solar
74	e_Mass	float	Uncertainty in the Mass	solar
75	rho	float	Stellar Density	solar
76	e_rho	float	Uncertainty in the Stellar Density	solar
77	LumClass	string	Luminosity Class	
78	Lum	float	Stellar Luminosity	solar
79	e_Lum	float	Uncertainty in Luminosity	solar
80	d	float	Distance	pc
81	e_d	float	Uncertainty in the distance	pc
82	e(b-v)	float	Applied Color Excess	mag
83	e_e(b-v)	float	Uncertainty in Applied Color Excess	mag
84	numcont	long	Number of Contamination Sources	
85	contratio	float	Contamination Ratio	
86	disposition	string	Disposition type	
87	dup_id	long	Points to the duplicate object TIC ID	
88	priority	double	CTL priority	
89	eneg_EBV	float	Negative error for EBV	mag
90	epos_EBV	float	Positive error for EBV	mag
91	EBVFlag	string	Source of EBV	
92	eneg_Mass	float	Negative error for Mass	solar
93	epos_Mass	float	Positive error for Mass	solar
94	eneg_Rad	float	Negative error for Radius	solar
95	epos_Rad	float	Positive error for Radius	solar
96	eneg_rho	float	Negative error for Density	solar
97	epos_rho	float	Positive error for Density	solar
98	eneg_logg	float	Negative error for Surface Gravity	cgs
99	epos_logg	float	Positive error for Surface Gravity	cgs
100	eneg_lum	float	Negative error for Luminosity	solar
101	epos_lum	float	Positive error for Luminosity	solar
102	eneg_dist	float	Negative Error for Distance	pc
103	epos_dist	float	Positive Error for Distance	pc
104	distFlag	string	Source of distance	
105	eneg_Teff	float	Negative error for effective temperature	K
106	epos_Teff	float	Positive error for effective temperature	K
107	TeffFlag	string	Source of effective Temperature	
108	gaiabp	float	Gaia Bp magnitude	mag
109	e_gaiabp	float	Error in Gaia Bp magnitude	mag

110	gaiarp	float	Gaia Rp magnitude	mag
111	e_gaiarp	float	Error in Gaia Rp magnitude	mag
112	gaiaqflag	int	Quality of Gaia information	
113	starchare Flag	float	Error of asymmetric errors	
114	VmagFlag	float	Source of V magnitude	
115	BmagFlag	float	Source of B magnitude	
116	splists	string	Identifies if star is in a specially curated list.	
117	e_RA	double	Error in RA	mas
118	e_Dec	double	Error in Dec	mas
119	RA_orig	double	RA from original catalog	deg
120	Dec_orig	double	Dec from original catalog	deg
121	e_RA_orig	double	Ra error as given in original catalog	mas
122	e_Dec_orig	double	Dec error as given in original catalog	mas
123	raddflag	int	1 - dwarf by radius, 0 - giant by radius	
124	wdflag	int	1 - star in Gaia's photometric "White Dwarf region"	

Detailed descriptions, and notes, of individual TICv8 columns

No. Name Notes

1 TICID A unique identifier for every object in the TIC. The ID is unique and permanent. If an object is removed from the TIC in later versions, a new object will never inherit an old ID.

2 Version This column denotes the date, in YYYYMMDD format, in which the TIC was finalized and prepared for delivery. For TICv8 this is 20190410.

3 HIP The matched Hipparcos identifier. This match has not been updated in TICv8.

4 TYC The matched Tycho identifier. This match has not been updated in TICv8.

5 UCAC The matched UCAC-4 identifier. This match has not been updated in TICv8.

6 TWOMASS The matched 2MASS identifier. This match has not been updated in TICv8.

7 SDSS The values given are the 64-bit "objID" values, not the IAU-format "SDSS J" identifiers. This match has not been updated in TICv8.

8 ALLWISE The matched ALLWISE identifier. This match has not been updated in TICv8.

9 GAIA The matched Gaia DR2 identifier has been updated in TICv8. Gaia IDs in TICv8 are included for stars that are found in the Gaia-provided Gaia-2MASS look-up table. These identifiers have been updated by the Gaia team from DR1 to DR2, and may not be consistent between TICv7 and TICv8.

10 APASS The matched APASS identifier. APASS stars do not have identifiers, only coordinates. The primary key of an internal TIC version of the APASS database table as a proxy identifier. This match has not been updated in TICv8.

11 KIC The matched Kepler Input Catalog (KIC) identifier. This match has not been updated in TICv8.

12 Objtype This column identifies the astronomical type for a given TIC object. An object in the TIC is either a STAR (1), or an EXTENDED (2) object.

13 Typesrc This column is a flag which denotes the source of the object in the TIC. These flags are briefly defined below, and users are directed to the appendix of the full documentation for a more comprehensive description of each source.

gaia2 - stellar source from Gaia DR2

hip - stellar source is hipparcos

cooldwarfs - stellar source is the cool dwarf list

2mass - stellar source is 2MASS

lepine - Lepine (2011,AJ, 142, 138) All-sky Catalog of Bright M Dwarfs

tmgaia - stellar source from Gaia DR1 with unique 2MASS match

tmgaia2 - stellar source from Gaia DR2 with unique 2MASS match

tmmgaia - stellar source from Gaia without unique 2MASS match

hotsubdwarf - stellar source is the hot subdwarf list

gicycle1 - stellar source is the GI cycle 1 program

gistars8 - stellar source is the GI cycle 2 program

Astroseis - point source from the asteroseismology group

14 RA The right ascension of the object in degrees. The right ascension is provided in epoch 2000 due to mission requirements. Users are requested to use the original catalog right ascension (column 119) when propagating positions forward.

15 Dec The declination of the object in degrees. The declination is provided in epoch 2000 due to mission requirements. Users are requested to use the original catalog declination (column 120) when propagating positions forward.

16 Posflag This column is a flag which denotes the source of a given TIC object's position. These flags are briefly defined below, and users are directed to the appendix of the full documentation for a more comprehensive description of each source.

gaia2 - stellar source from Gaia DR2

hip - stellar source is Hipparcos

cooldwarfs - stellar source is the cool dwarf list

2mass - stellar source is 2MASS

lepine - Lepine (2011, AJ, 142, 138) All-sky Catalog of Bright M Dwarfs

tmgaia - stellar source from Gaia DR1 with unique 2MASS match

tmgaia2 - stellar source from Gaia DR2 with unique 2MASS match

tmmgaia - stellar source from Gaia without unique 2MASS match

hotsubdwarf - stellar source is the hot subdwarf list

gicycle1 - stellar source is the GI cycle 1 program

Astroseis - point source from the asteroseismology group

2MASSEXT - extended source from 2MASS extended source catalog

17 pmRA The right ascension proper motions in mas/yr. The vast majority of the stars in TICv8 have their proper motions adopted from Gaia DR2, however, stars which were not identified in Gaia DR2 have their proper motions provided in the TICv7 order of preference described in Stassun et al. (2018, *AJ*, 156, 102).

18 pmRA_e The right ascension proper motion errors in mas/yr. The vast majority of stars in TICv8 have their proper motion errors adopted from Gaia DR2, however, stars which were not identified in Gaia DR2 have their errors adopted from additional catalogs following the order of preference used for TICv7 described in Stassun et al. (2018, *AJ*, 156, 102).

19 pmDec The declination proper motion in mas/yr. This columns follows similar rules described in the description for Column 17.

20 pmDec_e The declination proper motion error in mas/yr. This columns follows similar rules described in the description for Column 18.

21 PMFlag This columns is the flag which provides the source of the proper motion. The flags are provided below with a brief description. The vast majority of stars in TICv8 have their proper motion adopted from Gaia DR2, however, stars which were not identified in Gaia DR2 have their proper motions adopted from additional catalogs following the order of preference used for TICv7 described in Stassun et al. (2018, *AJ*, 156, 102).

gaia2 - proper motion from Gaia DR2

tgas - proper motion from Tycho2-Gaia Astrometric Solution

sblink - proper motion from SuperBlink

tycho2 - proper motion from Tycho 2

hip - proper motion from Hipparcos

ucac5 - proper motion from UCAC5

ucac4 - proper motion from UCAC4

hsoy - proper motion from Hot Stuff for One Year

22 plx The parallax values in mas. The vast majority of stars have parallaxes provided by Gaia DR2. Please note, in some cases, these parallaxes may be unphysical (negative), but they are reported identical to what is provided in Gaia DR2. In cases where a star does not have a parallax in Gaia DR2, the parallaxes were adopted following the order of preference used in TICv7 described in Stassun et al. (2018, *AJ*, 156, 102).

23 e_plx The error in the parallax in mas. The vast majority of stars have parallax errors provided by Gaia DR2. In cases, where a star does not have a parallax in Gaia DR2, the parallaxes were adopted following the order of preference used in TICv7 described in Stassun et al. (2018, *AJ*, 156, 102).

24 PARFlag This column is a flag which denotes the source of the parallax. The flags are provided below with a brief description. The vast majority of stars have parallaxes provided by Gaia DR2. In cases where a star does not have a parallax in Gaia DR2, the parallaxes were adopted following the order of preference used in TICv7 described in Stassun et al. (2018, *AJ*, 156, 102).

gaia2 - parallax from Gaia DR2

tgas - parallax from the Tycho-Gaia Astrometric Solution

hip - parallax from hipparcos.

25 GalLong The Galactic longitude of the object in degrees. This position is provided in epoch 2000 due to mission requirements.

26 GalLat The Galactic latitude of the object in degrees. This position is provided in epoch 2000 due to mission requirements.

27 EcLong The ecliptic longitude of the object in degrees. This position is provided in epoch 2000 due to mission requirements.

28 EcLat The ecliptic latitude of the object in degrees. This position is provided in epoch 2000 due to mission requirements.

29 Bmag The Johnson B magnitude. When an observed optical B magnitude is not provided, a B magnitude is calculated following the relations implemented for TICv7 described in Stassun et al. (2018, *AJ*, 156, 102).

30 e_Bmag The error in the Johnson B magnitude.

31 Vmag The Johnson V magnitude. Observed V magnitudes are preferred when they are converted from Tycho Vt, Hipparcos or UCAC. Otherwise, a Johnson V magnitude is calculated from the Gaia colors (G, Bp, Rp) for stars that do not have a reliable observed Johnson V magnitude. If a star does not have a reliable Gaia color, the V magnitude is calculated following the relations implemented for TICv7 described in Stassun et al. (2018, *AJ*, 156, 102).

32 e_Vmag The error in the Johnson V magnitude.

33 umag The u magnitude adopted from SDSS adopted when available.

34 e_umag The u magnitude error adopted from SDSS adopted when available.

35 gmag The g magnitude adopted from SDSS adopted when available.

36 e_gmag The g magnitude error adopted from SDSS adopted when available.

37 rmag The r magnitude adopted from SDSS adopted when available.

38 e_rmag The r magnitude error adopted from SDSS adopted when available.

39 imag The i magnitude adopted from SDSS adopted when available.

40 e_imag The i magnitude error adopted from SDSS adopted when available.

41 zmag The z magnitude adopted from SDSS adopted when available.

42 e_zmag The z magnitude error adopted from SDSS adopted when available.

43 Jmag The J magnitude adopted from 2MASS adopted when available.

44 e_Jmag The J magnitude error adopted from 2MASS adopted when available.

45 Hmag The H magnitude adopted from 2MASS adopted when available.

46 e_Hmag The H magnitude error adopted from 2MASS adopted when available.

47 Kmag The K magnitude adopted from 2MASS adopted when available.

48 e_Kmag The K magnitude error adopted from 2MASS adopted when available.

49 TWOMflag The quality flags from 2MASS are provided in a similar format to the EPIC catalog: ph_qual-rd_flag-bl_flg-cc_flg-gal_contam-mp_flag.

50 prox The distance in arcseconds to the 2MASS nearest neighbor.

51 W1Mag The W1 magnitude adopted from ALLWISE adopted when available.

52 e_W1Mmag The W1 magnitude error adopted from ALLWISE adopted when available.

53 W2Mag The W2 magnitude adopted from ALLWISE adopted when available.

54 e_W2Mmag The W2 magnitude error adopted from ALLWISE adopted when available.

55 W3Mag The W3 magnitude adopted from ALLWISE adopted when available.

56 e_W3Mmag The W3 magnitude error adopted from ALLWISE adopted when available.

57 W4Mag The W4 magnitude adopted from ALLWISE adopted when available.

58 e_W4Mmag The W4 magnitude error adopted from ALLWISE adopted when available.

57 Gmag The G magnitude adopted from Gaia DR2 adopted when available.

58 e_Gmag The G magnitude error adopted from Gaia DR2 adopted when available.

61 Tmag The TESS magnitude for the object, this column is never NULL. The Tmag values are typically based on relations that depend on Gaia Bp and Rp magnitudes (see section 3.2.1 in the full documentation for the relation). TESS magnitudes for objects without appropriate Gaia Bp or Rp magnitude had their TESS magnitudes calculated using relations implemented for TICv7 described in Stassun et al. (2018, *AJ*, 156, 102). Stars which were in the specially curated hot subdwarfs, and cool dwarfs lists had their TESS magnitudes directly adopted.

62 e_Tmag The error in the TESS magnitude.

63 TESSflag These flags denote which relation, or catalog, provides the TIC TESS magnitude. Full descriptions can be found in Section 2.3.1 of thefull documentation:

Flags described in TICv8 documentation

- goffs - magnitude from offset from Gaia
- gpbr - magnitude from cooldwarfs
- gbprp - magnitude calculated from observed Gaia Bp-Rp
- rered - magnitude calculated after de-reddening Gaia Bp-Rp and re-reddening the result
- hotsd - magnitude from the hot subdwarf list
- cdwrf - magnitude from cool dwarf list (Muirhead et al 2018)

Flags described in TICv7 documentation

- gaiav - magnitude calculated from G and V (see Stassun et al. 2018, *AJ*, 156, 102))
- gaiaj - magnitude calculated from G and 2MASS J (see Stassun et al. 2018, *AJ*, 156, 102))
- gaiah - magnitude calculated from Gaia and 2MASS H (see Stassun et al. 2018, *AJ*, 156, 102))
- gaiak - magnitude calculated from G and 2MASS Ks (see Stassun et al. 2018, *AJ*, 156, 102))
- voffset - magnitude calculated from V and offset (see Stassun et al. 2018, *AJ*, 156, 102))
- gaiaoffset - magnitude calculated from G and an offset (see Stassun et al. 2018, *AJ*, 156, 102))
- joffset - magnitude calculated from 2MASS J offset (+0.5 for J-Ks < -0.1) (see Stassun et al. (2018, *AJ*, 156, 102))
- joffset2 - magnitude calculated from 2MASS J and an offset (+1.75 for J-Ks > 1) (see Stassun et al. (2018, *AJ*, 156, 102))
- hoffset - magnitude calculated from 2MASS H offset (see Stassun et al. (2018, *AJ*, 156, 102))
- koffset - magnitude calculated from 2MASS Ks and offset (see Stassun et (2018, *AJ*, 156, 102))
- vjh - magnitude calculated from V and 2MASS J-H (see Stassun et al. (2018, *AJ*, 156, 102))
- jhk - magnitude calculated from 2MASS J-Ks (see Stassun et al. (2018, *AJ*, 156, 102))
- vjk - magnitude calculated from V and 2MASS J-Ks (see Stassun et al. (2018, *AJ*, 156, 102))
- jh - magnitude calculated from 2MASS J-H (see Stassun et al. (2018, *AJ*, 156, 102))
- tmvk - magnitude calculated from V and 2MASS Ks (same as vk) (see Stassun et al. (2018, *AJ*, 156, 102))
- bpjk - magnitude calculated from photographic B and 2MASS J-Ks (see Stassun et al. (2018, *AJ*, 156, 102))
- from_apass_i - magnitude from cool dwarf list (Muirhead et al 2018)
- from_sdss_ik - magnitude from cool dwarf list (Muirhead et al 2018)
- wmean_vk_jhk - magnitude from cool dwarf list (Muirhead et al 2018)

64 SPFlag These flags denote the origin of stellar parameters:

- cdwrf - mass and radius adopted from the Cool Dwarf list
- hotsd - mass and radius adopted from the Hot Subdwarf list

gaia2 - mass and radius computed using Gaia DR2 parameters

tic7 - mass and radius directly copied from TICv7

65 Teff The effective temperature of the object in K. The effective temperatures come from one of four sources, in the following order of preference: (1) the Cool Dwarf list or the Hot Subdwarf list; (2) spectroscopic catalogs (see Column 64); (3) dereddended Bp-Rp color (column 108, 110); and (4) non-dereddened Bp-Rp color (column 108, 110).

66 e_Teff The error in the effective temperature of the object in K. The error provided for the effective temperature is a symmetrized error, calculated by arithmetic mean of the asymmetric errors (columns 105 and 106). It is possible these errors may be larger than the value reported in column 65. Users are cautioned this means the reported value is untrustworthy.

67 Logg The surface gravity of the object in cgs. The surface gravity is calculated using the nominal formula: log10(G*M * Msun/(R * Rsun)^2). Where Msun is the mass of the Sun, G is the gravitational constant, Rsun is the Radius of the Sun, M is the mass of the star (column 73), and R is the radius of the star (column 71). Some stars may have unphysical log(g) values for their estimated temperature, such as log(g) > 5, but these log(g) values should be internally consistent with the provided mass and radii of each star. The surface gravities provided are not the values reported by spectroscopic catalogs; they are always calculated from the reported masses and radii of a given object.

68 e_logg The error in the surface gravity in cgs units.The error provided for the surface gravity is a symmetrized error, calculated by arithmetic mean of the asymmetric errors (columns 98 and 99). It is possible these errors may be larger than the value reported in column 67. Users are cautioned this means the reported value is of untrustworthy.

79 M/H The metallicity of the object in dex. The metallicity is only provided if it was reported in a spectroscopic catalog matched to TICv8, using the order preference described in section 2.1.1 of the full documentation. If a catalog provided more than one measurement of the metallicity for the a single object, the metallicities were combined using a weighted-mean. These metallicities were not used in any calculation, are only provided for convenience, and may conflict with reported masses and radii -- especially for very metal rich or very metal poor stars. Users are cautioned against using the reported metallicities with the calculated TICv8 stellar parameters, without additional vetting.

70 e_M/H The error in the metallicity of an object in dex. For stars with spectroscopic metallicity from a single observation, theerror was copied from the relevant catalog. The SPOCS and GALAH catalogs do not provide uncertainties for metallicities; 0.10 and 0.05 dex were assigned, respectively, based on the reported statistical error from these catalogs.

71 Rad The stellar radius in solar units. The vast majority of stellar radii in TICv8 were estimated using three techniques, in the following order of preference: (1) radii provided by the specially curated Cool Dwarf list; (2) radii provided in the Hot Subdwarf list; or (3) using the Gaia distance, bolometric corrections, G magnitude, and a preferred temperature. (4) Some stars had their properties either imported directly from TICv7, or calculated using TICv7 relationships, if their Gaia parameters were deemed unreliable enough to determine stellar characteristics (gaiaqflag = 0; column 112). Users are directed to Stassun et al. (2018, *AJ*, 156, 102) for a detailed description of the relations used to estimate these radii.

72 e_Rad The error in the radius in solar units. The error provided for the radius is a symmetrized error, calculated by arithmetic mean of the asymmetric errors (columns 95 and 96). It is possible these errors may be larger than the value reported in column 71. Users are cautioned this means the reported value is of untrustworthy.

73 Mass The stellar mass in solar units. The stellar masses were estimated using three techniques: (1) masses provided in the specially curated cool dwarf list; (2) masses provided in the specially curated hot subdwarf list; or (3) using a unified relation based on measured masses for eclipsing binaries as well as simulations using Galactic structure models (see section 2.2.5 in the full documentation for details).

74 e_Mass The error in the mass in solar units. The error provided for the mass is a symmetrized error, calculated by arithmetic mean of the asymmetric errors (columns 92 and 93). It is possible these errors may be larger than the value reported in column 73. Users are cautioned this means the reported value is of untrustworthy.

75 Rho The density of the object in solar units. The density is calculated using the formula M/R^3, where M is the mass of the star (column 73) and R is the radius of the star (column 71).

76 Rho_e The error in the density in solar units. The error provided for the density is a symmetrized error, calculated by arithmetic mean of the asymmetric errors (columns 96 and 97). It is possible these errors may be larger than the value reported in column 75. Users are cautioned this means the reported value is of untrustworthy.

77 LumClass This flag denotes the luminosity class of the star. These flags are defined as follows:

dwarf - the star has a radius smaller than the line in Figure 10 of the full documentation

giant - the star has a radius larger than the line in Figure 10 of the full documentation

rpmjdwarf - the star has unreliable Gaia information, but the reduced proper motion calculated in TICv7 identifies the star as a dwarf.

rpmjgiant - the star has unreliable Gaia information, but the reduced proper motion calculated in TICv7 identifies the star as a giant.

Stars with the flags of rpmjdwarf and rpmjgiant are assumed to be a dwarf, or giant stars based on their reduced proper motion in coordination with their 2MASS J magnitude (see Stassun et al. (2018, *AJ*, 156, 102)). Users should be aware the rpmjdwarf flag effectively means that the star is either a dwarf or a subgiant, based on reduced proper motion cuts.

78 Lum The luminosity of the object in solar units. The luminosity is calculated using the following formula and defined in solar units: R^2*(Teff /5772)^4, where R is the radius of the star (column 73) and Teff is the effective temperature (column 65).

79 Lum_e The error in the luminosity in solar units. The error provided for the luminosity is a symmetrized error, calculated by arithmetic mean of the asymmetric errors (columns 100 and 101). It is possible these errors may be larger than the value reported in column 78. Users are cautioned this means the reported value is of untrustworthy.

80 d The distance to the object in pc. These distances have been adopted from Bailer-Jones et al. (2018), when available. While some parallax measurements may be negative, the Bailer-Jones distance estimator is always positive.

81 e_d The error in the distance to the object in pc. The error in the distance is a symmetrized error, calculated by arithmetic mean of the asymmetric errors (columns 102 and 103). It is possible these errors may be larger than the value reported in column 80. Users are cautioned this means the reported value is of untrustworthy.

82 e(b-v) The applied color excess for the object in mag. Wherever possible we de-reddened adopted used E(B-V) from the Pan-STARRS dust map and the Schlegel et al. (1998) map where either the star is outside the Pan-STARRS footprint. The extinction value for stars with distances less than 100 pc has been set to 0. We applied a correction factor of 0.884 for the conversion from Schlegel 1998 to Schlafly & Finkbeiner 2011. Values based on Schlegel have been corrected for the distance, values based on Pan-STARRS depend intrinsically on distance. Column 91 indicates which of the dustmaps would be used for dereddening. Please note that dereddening corrections are only applied if the Gaia quality flag is 1.

83 e_e(b-v) The error in the color excess for the object in mag. The error in the color excess is a symmetrized error, calculated by arithmetic mean of the asymmetric errors (columns 89 and 90). t is possible these errors may be larger than the value reported in column 82. Users are cautioned this means the reported value is of untrustworthy.

84 numcont The number of contaminants found within 10” of the star, used in the calculation of the contamination ratio.

85 contratio The contamination ratio is defined as the nominal flux from the contaminants divided by the flux from the source. Flux contamination is calculated for all stars in the CTL, and the procedure for TICv8 is identical to the procedure for TICv7. See section 3.3.3 of Stassun et al. (2018, *AJ*, 156, 102) for a complete description of the contamination ratio calculation.

86 disposition This column identifies objects that are included in the TIC, but are likely spurious, or related to other TIC objects in a non-trivial, non-astrophysical way. Currently, this column is populated as a NULL, DUPLICATE (6), ARTIFACT (7), or SPLIT (8). When a single star in a previous TIC is found to be two or more actual sources due to the enhanced resolution of Gaia DR-2, the original TICID gets the disposition SPLIT. New TICIDs are assigned to the objects and the original TICID is in column DUP_ID (column 87). The original star “SPLIT” star will have NULL in the dup_id. The DUPLICATE flag means the star is listed twice (or more) in the TIC due to prior cross-matching difficulties. In this case, DUP_ID contains the TICID of the real star.

87 dup_id This column points to the TIC ID of the ‘other’ object in a DUPLICATE, or SPLIT set of stars.

88 priority Priority of target for observation. This is a floating-point value ranging from 0 to 1, where 1 is highest priority. The priority is based on the relative ability of TESS to detect small planetary transits, and is calculated using the radius of the star, the contamination ratio, and the total expected photometric precision. Stars are given a boost factor to their priority that scales with a probabilistic model of the expected number of sectors any given star could fall in. Typically, the closer the star is to the Ecliptic North or South pole, the larger the boost factor. Stars close to the Galactic Plane (|b|<10 degrees) have been de-boosted by a factor of 0.1 since we generally have a poor understanding of their true reddening, unless they are in the specially curated cool dwarf list (see Muirhead et al. 2018) or hot subdwarf list.

The formula is defined for CTLv8.01 is: sqrt(Ns)/(R^1.5*sigma)

where *Ns* is the expected number of *TESS* sectors to observe the star; *R* is the radius of the star (column 71), and sigma is the expected photometric precision of the star based on the *TESS* magnitude (column 61) using the formulation from Pepper et al. 2018 (in prep). The priority is normalized by the priority for a star with *R* = 0.1 solar, *Ns* = 12.654 sectors, no contamination and sigma = 61.75 ppm.

Some stars will have distinct priorities:

Stars with log(g) values that are greater than 5 have had their priorities set to 0 to avoid biases from poor quality effective temperature, extinction, or parallax measurements. Stars in the specially curated lists are excluded from this scenario.

Stars with ecliptic latitudes (column 28) less than ~6 degrees in absolute value are not expected to be observed as part of the main mission due to a gap in camera coverage between the Southern and Northern observations. Therefore, their *Ns* values are 0 and thus the priority is 0.

89 eneg_EBV The lower asymmetric error on the color excess. The asymmetric errors are calculated using a Monte-Carlo procedure for stars in CTLv8.01 (see section 3.2.2 of the full documentation).

90 epos_EBV The upper asymmetric error on the color excess. The asymmetric errors are calculated using a Monte-Carlo procedure for stars in CTLv8.01 (see section 3.2.2 of the full documentation).

91 EBVFlag This flag denotes the source of the adopted extinction:

- 0 - A color excess applied of 0 (star is closer than 100 pc)
- 1 - Reddening applied from Schlegel dust maps
- 2 - Reddening applied from Pan-STARRS dust maps

92 eneg_Mass The lower asymmetric error for the mass in solar units. The asymmetric errors are calculated using a Monte-Carlo procedure for stars in CTLv8.01 (see section 3.2.2 of the full documentation).

93 epos_Mass The upper asymmetric error for the mass in solar units. The asymmetric errors are calculated using a Monte-Carlo procedure for stars in CTLv8.01 (see section 3.2.2 of the full documentation).

94 eneg_Rad The lower asymmetric error for the radius in solar units. The asymmetric errors are calculated using a Monte-Carlo procedure for stars in CTLv8.01 (see section 3.2.2 of the full documentation).

95 epos_Rad The upper asymmetric error for the radius in solar units. The asymmetric errors are calculated using a Monte-Carlo procedure for stars in CTLv8.01 (see section 3.2.2 of the full documentation).

96 eneg_rho The lower asymmetric error for the density in solar units. The asymmetric errors are calculated using a Monte-Carlo procedure for stars in CTLv8.01 (see section 3.2.2 of the full documentation).

97 epos_rho The upper asymmetric error for the density in solar units. The asymmetric errors are calculated using a Monte-Carlo procedure for stars in CTLv8.01 (see section 3.2.2 of the full documentation).

98 eneg_logg The lower asymmetric error for the surface gravity in cgs units. The asymmetric errors are calculated using a Monte-Carlo procedure for stars in CTLv8.01 (see section 3.2.2 of the full documentation).

99 epos_logg The upper asymmetric error for the surface gravity in cgs units. The asymmetric errors are calculated using a Monte-Carlo procedure for stars in CTLv8.01 (see section 3.2.2 of the full documentation).

100 eneg_lum The lower asymmetric error for the luminosity in solar units. The asymmetric errors are calculated using a Monte-Carlo procedure for stars in CTLv8.01 (see section 3.2.2 of the full documentation).

101 epos_lum The upper asymmetric error for the luminosity in solar units. The asymmetric errors are calculated using a Monte-Carlo procedure for stars in CTLv8.01 (see section 3.2.2 of the full documentation).

102 eneg_dist The lower asymmetric error for the distance in pc. The asymmetric errors are calculated using a Monte-Carlo procedure for stars in CTLv8.01 (see section 3.2.2 of the full documentation).

103 epos_dist The upper asymmetric error for the distance in pc. The asymmetric errors are calculated using a Monte-Carlo procedure for stars in CTLv8.01 (see section 3.2.2 of the full documentation).

104 distFlag This column displays the source of the distance. The flag descriptions are provided below with a brief explanation.

105 eneg_Teff The lower asymmetric error for the effective temperature in K. The asymmetric errors are calculated using a Monte-Carlo procedure for stars in CTLv8.01 (see section 3.2.2 of the full documentation).

106 epos_Teff The upper asymmetric error for the effective temperature in K. The asymmetric errors are calculated using a Monte-Carlo procedure for stars in CTLv8.01 (see section 3.2.2 of the full documentation).

107 TeffFlag The source of the effective temperature. The flag descriptions are provided below with a brief explanation.

- cdwrf - temperature from the cool dwarf specially curated list
- hotsd - temperature from the hot subdwarf specially curated list
- gaia2 - temperature from Gaia Bp - Gaia Rp color
- spect - temperature from a spectroscopic catalog
- tic7 - temperature imported from TICv7

108 gaiabp The Gaia Bp magnitude, adopted when available.

109 e_gaiabp The error in the Gaia Bp magnitude, adopted where available.

110 gaiarp The Gaia Rp magnitude, adopted when available.

111 e_gaiarp The error in the Gaia Rp magnitude, adopted when available.

112 gaiaqflag Boolean flag that denotes the quality of the Gaia parallax and magnitude information:

- -1 - insufficient information
- 0 - star fails astrometric or photometric quality check
- 1 - star passes both checks

113 starchareFlag unused

114 VmagFlag The source of the V magnitude. The source flags are defined below:

- ucac4 - V magnitude calculated from ucac4 magnitude
- tycho2v3- V magnitude calculated from Tycho2 Vt
- tycho2v - V magnitude calculated from Tycho2 Vt
- tycho - V magnitude calculated from Tycho 2 Vt
- gaia2 - V magnitude from Gaia Bp - Gaia Rp color
- None - should be NULL
- apassdr9 - V magnitude adopted from APASS DR-9
- apass - V magnitude adopted from APASS DR-7

sblink - V magnitude adopted from Super Blink

mermil - V magnitude adopted from the Mermilliod catalog

cdwarf - V magnitude adopted from the cool dwarf catalog (v6)

cdwrf - V magnitude adopted from the cool dwarf catalog (v7)

sirful - V magnitude adopted from the Sirful catalog

hipvmag - V magnitude calculated from Hipparcos

gaiak - V magnitude calculated from Gaia DR-1 G and 2MASS Ks

115 BmagFlag The source of the B magnitude. The source flags are defined below:

tycho2b3- B magnitude calculated from Tycho2 Bt

tycho2b - B magnitude calculated from Tycho2 Bt

tycho - B magnitude calculated from Tycho 2 Bt

None - should be null

apassdr9 - B magnitude adopted from APASS DR-9

bpbj - B magnitude calculated from 2MASS photometric B

mermil - B magnitude adopted from the Mermilliod catalog

116 splists Identifies whether the star is in a special list. The flags are provided below with a brief description.

Cooldwarfs_v8 - cool dwarf star version TICv8

Hotsubdwarfs_v8 - hot subdwarf star version TICv8

117 e_RA The error in the right ascension in milliarcseconds.

118 e_Dec The error in the declination in milliarcseconds.

119 RA_orig The right ascension in degrees, as provided in the source catalog of the position.

120 Dec_orig The declination in degrees, as provided in the source catalog of the position.

121 e_RA_orig The error in the right ascension in milliarcseconds, as provided in the source catalog of the position.

122 e_Dec_org The error in the declination in milliarcseconds, as provided in the source catalog of the position.

123 raddflag Boolean flag that denotes if the star is a dwarf by its radius:

-1 - insufficient information

0 - star is not a dwarf

1 - star is a dwarf

124 wdflag Boolean flag that denotes if the star is in Gaias photometric “White Dwarf Region” on the HRD:

-1 - insufficient information

0 - star is not in the White Dwarf region

1 - star is in the White Dwarf region