

**UNIVERSIDAD COMPLUTENSE DE MADRID**  
**FACULTAD DE CIENCIAS FÍSICAS**

**Máster en Astrofísica**



**TRABAJO DE FIN DE MÁSTER**

Tras las huellas de la evolución de estrellas AGB binarias y pPNe: estudio  
de variabilidad con TESS

In Search of the Traces of the Evolution of AGB Binary Stars and pPNe: A  
Study of Variability with TESS

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# 1 Catalog tables

## 1.1 Merc et. al.

Table 1: Stellar parameters for objects in Merc, J. et al. (2024) with positive flickering detection using TESS light curves.

Name	TIC ID	Mag.	Sectors	CROWDSAP
694 Mon	403675153	8.65	87	0.985
ASAS J152058-4519.7	146068950	9.16	65	0.929
CN Cha	394916057	7.02	64,66	0.992
RT Cru	180045004	8.88	64,65	0.758
T CrB	462607643	7.73	24,25,51,78	1.000
420 Hya	443619246	7.37	37,64	1.000
AR Pav	304202168	9.82	66	0.956
AX Per	453231036	8.74	58	0.980
Hen 3-461	303495210	8.19	36,37,63	0.975
KXTrA	447290900	9.74	66	0.859
NSV 20400	442569144	10.69	65	0.931
V417 CMa	63477133	8.01	87,88	0.994
Z And	26011110	8.11	57	0.994
V* NQ Gem	94748223	6.23	71,72	0.998
CD-57 3057	463038319	6.93	36,37,63,64	0.981
V* BI Cru	311758230	9.53	37,38,64,65	0.868
V* RX Pup	182401518	10.90	35,88,89	0.932

Table 2: Stellar parameters for objects in Merc, J. et al. (2024) with negative flickering detection using TESS light curves.

Name	TIC ID	Mag.	Sectors	CROWDSAP
BX Mon	64333488	8.61	7	0.973
CH Cyg	350739215	3.73	14,15,40,54,55,56, 74,75,80,81,82	0.998
EG And	115780639	5.30	17,57,84	1.000
RS Oph	6348255	9.46	80	0.959
SU Lyn	11670502	5.00	20,60,73	1.000
V1044 Cen	30541762	8.69	37,64	0.898
V407 Cyg	357457104	9.52	15,16,55,56,75,76, 82,83	0.911
ZZ CMi	453173127	6.38	87	0.999
omi Cet (Mira)	332890609	2.26	31,4	0.904
AE Ara	30667659	9.93	66	0.924
HD 330036	279627924	10.15	65	0.921
Hen 3-1213	26292371	9.83	66	0.883
Hen 3-863	244906894	10.96	37	0.941
AG Dra	237100139	8.38	56,57,58,60,74,75,76,77, 78,79,80,81,82,83,84,85	1.000
AG Peg	385053976	6.86	82	0.999
CI Cyg	83299618	7.94	74,75,81,82	0.982
DD Mic	126658353	9.93	1,27,67	0.975
ER Del	282619434	7.87	81	0.989

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Table 2 – *Continued from previous page*

Name	TIC ID	Mag.	Sectors	CROWDSAP
HM Sge	342021932	11.25	40,41,54,81	0.679
Hen 3-160	139977336	12.52	35,36	0.863
Hen 3-1768	346727757	10.10	27,39,66,67	0.974
Hen 3-860	244876801	11.88	37,38	0.921
IV Vir	46022938	9.34	64	0.996
PN MaC 1-17	7064267	16.68	80	0.013
PU Vul	402762666	9.94	54,55,81,82	0.913
RR Tel	421990485	10.88	27,67	0.980
RW Hya	58761688	7.23	37,64	0.999
StHA 180	248105480	11.03	81	0.997
StHA 190	388775434	9.67	82	0.997
StHA 32	298812903	11.52	5	0.986
TX CVn	389852937	8.74	76	1.000
UV Aur	2688613	6.39	43,44,45,59,71	0.970
V1016 Cyg	171876171	11.21	41,54,55,75,81,82	0.801
V1329 Cyg	230861869	10.96	41,55,75,82	0.934
V366 Car	469253499	10.68	36,37	0.871
V399 Pav	466125998	8.70	27,66,67	0.996
V417 Cen	334771334	9.45	38,65	0.910
V443 Her	333326188	8.75	80	0.951
V471 Per	241112109	11.92	85	0.670
V835 Cen	333861396	12.70	38	0.466
V934 Her	257212213	5.74	25,52,79	0.999
WRAY 15-157	154230723	11.86	88	0.826
YY Her	329668061	10.78	80	0.984

## 1.2 Isolated AGB stars

TIC ID	Mag.	Sectors	CROWDSAP	Binary Likeness
147795605	7.7	60	0.968	50
336728909	10.19	57	0.999	50
354209282	6.15	56	1.0	50
91104738	5.57	56,83	1.0	50
296974016	7.93	63	0.999	50
16880539	5.31	57,84	0.997	50
139121623	3.97	27,28,68	0.999	50
431603831	9.59	57	0.907	50
24350903	2.47	42,55,82	0.994	50
71032449	4.69	36	0.998	50
95749776	4.17	34,61,88	0.997	50
397059905	3.63	46	1.0	50
49907986	10.84	31	0.987	50
310965017	3.86	14,21,41,47,74,75	1.0	50
114858879	5.19	69	1.0	50
293340820	2.26	42,70	0.999	50
230092799	7.14	56,57,58,59,60	0.999	50
392486056	2.88	19,59,86	0.999	50
386610785	2.81	35,62,89	0.999	50
264413925	7.53	71,72	0.993	50
58872758	6.61	70	0.996	50

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Table 3 – *Continued from previous page*

<b>TIC ID</b>	<b>Mag.</b>	<b>Sectors</b>	<b>CROWDSAP</b>	<b>Binary Likeness</b>
9378824	3.28	22,48	1.0	50
13939217	7.42	57	0.999	50
310965252	4.88	14,20,21,40,41,47,48, 74,75	1.0	50
136887637	4.33	31	1.0	50
207205231	3.48	29,30,69	0.999	50
14445782	7.58	71,72	0.987	100
194204295	7.44	57	0.99	100
422989548	7.69	17,20,21,23,24,25,26, 56,57,58,59,60	0.998	100
303951100	7.33	67,68	0.996	100
290663195	7.06	67	0.997	100
38570471	7.24	62	0.996	100
316417053	7.13	41,48,49,75,76	0.999	100
232628114	7.89	56,57,58,59,60	0.876	100
79225050	8.11	67	0.998	100
344220905	7.08	56	0.999	100
75463292	8.37	66	0.982	100
327010620	7.08	58	0.998	100
147407408	5.71	28,68	0.997	100
285004409	6.63	72	0.999	100
201723935	3.52	13,27,67	0.998	100
411252917	3.73	46,50	1.0	100
420129036	3.79	14,15,17,18,19,20,21, 22,23,24,26,40,41,47,48, 49,50,51,52,53,54,55,57, 58,59,60,73,74,75,76,77, 78,79,80,81,84,85,86	0.999	100
162238845	4.28	15,16	0.999	100
40048460	4.49	30,42,70	1.0	100
149018345	4.75	29,69	1.0	100
307985697	4.89	14,15,16,17,18,19,21, 22,23,24,25,26,40,41,47, 48,49,51,52,53,54,55,56, 57,58,59,60,74,75,76,78, 79,80,82,83,84,85,86	0.999	100
159331270	5.15	14,15,19,20,21,26,40, 41,47,48,52,53,59,60,73, 75,79,82	0.995	100
240161571	5.35	20,44,45,71,72	0.995	100
310627323	5.36	25,51,52,78,79	0.999	100
257658027	5.64	31,32	1.0	100
406278478	8.45	67	0.998	100
18692866	5.83	20,47,60	1.0	100
144002280	6.14	68	1.0	100
231062839	6.34	69	1.0	100
140639569	7.03	59	0.991	100
92653030	8.61	68	0.992	100
451568818	7.63	66,67	0.997	100
142987946	9.41	63	0.996	100
142785775	9.27	60	0.99	100

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Table 3 – *Continued from previous page*

TIC ID	Mag.	Sectors	CROWDSAP	Binary Likeness
47381029	9.34	69	0.999	100
88784758	9.03	65	0.995	100
177624958	9.97	65	0.947	100
202509423	8.91	57	0.999	100
386890213	9.14	72	0.994	100
265304533	7.1	61	0.999	150
9042889	9.26	59	0.942	150
445843374	2.69	23,50,77	0.999	150
301502440	3.09	27	0.998	150
55487092	6.54	60	0.999	150
239622721	3.62	15,16,56,82,83	0.999	150
13816382	6.48	61	0.998	150
21222271	8.63	72	0.999	150
117927634	5.8	57,84	1.0	150
16916903	4.41	17,57,84	1.0	150
399118541	5.59	23,46	1.0	150
139552896	5.57	32	1.0	150
452980210	7.12	61	0.999	150
369660125	5.54	57,84	0.999	150
356257320	5.51	38,39,65,66	0.997	150
142591515	5.43	14,20,21,40,41,47,48, 60,74,75	0.999	150
44486489	5.28	17,57,84	0.999	150
23815594	4.83	23,50,77	1.0	150
387272356	9.95	58,60	0.996	150
450348475	4.16	23,24,50,77	1.0	150
410417579	5.65	12,13,27,39,65,66,67	1.0	150
165559578	8.6	63,64	0.998	150
219850271	8.72	56,57,58,59,60	0.994	150
374202329	7.83	56,57	0.98	150
129077819	8.84	27,67	0.991	150
58227898	9.14	70,71	0.98	150
120504920	8.14	69	1.0	150
397514892	8.25	26,58,59,60,78	0.999	150
264248402	8.27	56,57,58,59,60	0.995	150
137805888	7.52	69	0.998	150
370204006	7.74	67	0.999	150
71226825	8.7	61	0.997	150
274578622	7.72	57	1.0	150
47177223	9.08	62	0.996	150
238720786	3.02	18,58,85	0.997	200
345136771	2.75	10,36,37,63	0.999	200
302066927	2.66	27,67	0.999	200
423658228	2.5	10,37,64	0.999	200
257741041	2.45	46	1.0	200
23676007	4.91	23,49,50	0.999	200
2351077	10.52	62	0.924	200
72980626	9.74	61	0.939	200
415734103	11.05	60	0.982	200
129684571	7.89	57	0.998	200
418173060	3.35	45,46,72	0.999	200

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Table 3 – *Continued from previous page*

TIC ID	Mag.	Sectors	CROWDSAP	Binary Likeness
248344767	7.31	70	1.0	200
401603284	8.8	67	0.99	200
78152264	6.81	62	0.995	200
25472862	6.66	57	0.994	200
35260243	6.84	72	1.0	200
73569673	5.95	58,85	0.999	200
455204108	7.68	61	0.998	200
188241000	7.53	63	0.994	200
9788469	9.17	69,70	0.998	200
425863843	8.98	68,69	0.998	200
4385592	9.51	60,71,72	0.999	200
300662518	6.39	67	0.996	200
308083402	10.31	62,63,64,65,69	0.965	250
380542758	9.28	72	0.999	250
382415835	9.05	69	0.998	250
31233320	9.63	67	0.982	250
119668871	10.34	66	0.956	250
365207304	10.66	70,71	0.978	250
379506745	10.66	66,67	0.919	250
155999551	11.21	23,24,50,51	0.996	250
165664782	11.29	64	0.852	250
26465548	11.4	72	0.738	250
257439320	11.92	56	0.96	250
159241821	9.06	59,60	0.997	250
24801020	9.25	62	0.975	250
91913512	10.19	63,64	0.916	250
74646293	10.12	66	0.926	250
277595145	9.42	67	0.945	250
311111531	9.66	66	0.969	250
72406617	9.39	72	0.999	250
166555111	8.45	21	0.999	250
15735094	9.79	70,71	0.992	250
306983642	9.36	66	0.962	250
25118602	9.37	61,62,63,64,65,66, 67,68	0.976	250
233045313	9.84	56,59,60	0.993	250
464617913	9.29	66,67	0.97	250
144914450	10.1	64	0.997	250
204374656	8.27	69	0.99	300
176873464	8.6	61,62,63,64,66,67,68	0.993	300
408411255	7.43	70	0.997	300
231074988	7.99	61,62,63,64,65,66, 67,68,69	0.993	300
303768976	11.38	71	0.94	300
357475953	8.94	50,51,77,78	0.998	300
36695189	9.82	70	0.998	300
328936362	12.32	59,60	0.8	300

Table 3: Stellar parameters for the final control sample catalog of likely isolated AGB stars. Stars were classified according to surplus T band magnitude with respect to T-NUV, as described in the text. Stars with higher excess have higher Binary Likeness value.

### 1.3 x-AGB

Name	TIC ID	Mag.	Sectors	CROWDSAP
CD-38_3905	132636906	8.40	61,62	0.904
HD_165774	330960059	6.06	13,66	0.989
HD_187372	272841269	4.40	14,15,41,54,55,56,74,75,82	0.999
IRAS_08427+0338	350315597	11.32	61	0.980
V*_CI_Hyi	234300677	5.26	27,29,67,69	0.998
V*_DH_Eri	178804201	5.14	31,32	1.000
V*_EY_Hya	393806122	4.69	34,61,88	0.999
V*_R_Aqr	92138849	5.36	29,69,70	1.000
V*_TW_Cen	112098802	6.43	64	0.987
V*_V1261_Ori	24603068	4.72	32	1.000
V*_Y_Gem	70580781	5.05	44,45,46,71	0.999
WRAY_16-147	329892320	13.15	38	0.711
WRAY_18-305	212203684	8.85	66	0.945

Table 4: Stellar Parameters of the x-AGB sample.

### 1.4 van Winkle

Name	TIC ID	Mag.	Sectors	CROWDSAP
89_Her	285139576	5.08	26,40,52,53,79,80	0.999
BD+46_442	327790652	8.89	58	0.978
DY_Ori	151405646	9.85	71,72	0.968
HD_108015	72069886	7.52	64	0.985
HD_131356	259921603	8.00	65	0.954
HD_213985	188569689	8.73	69	0.999
HD_46703	149984609	8.43	60	0.997
HD_52961	425148238	6.83	71,72	0.998
HD_95767	466257017	8.03	63,64	0.858
HR_4049	168346285	5.15	36,62,63,89	1.000
IRAS_06165+3158	138176686	10.09	60,71,72	0.988
RU_Cen	258316366	8.26	64	0.991
SAO_173329	100017389	10.07	61	0.876
ST_Pup	148400669	9.49	61	0.989
SX_Cen	15520060	10.12	64	0.968
TW_Cam	305967956	8.22	59	0.982
U_Mon	6423203	5.62	34,88	0.999

Table 5: Stellar Parameters of the post-AGB stars included in Oomen et al. (2018).

### 1.5 Variability Catalog of Stars Observed during the TESS Prime Mission

Name	TIC ID	Mag.	Sectors	CROWDSAP
*_73_Ori	434408053	5.42	33,43,44,45,71,72,87	0.999
HD_15629	49720925	8.00	18,58	0.980
HD_161796	316493106	6.75	24,25,26	0.999
HD_239626	329074395	8.91	15,16,17,56,57,84	0.755

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Table 6 – *Continued from previous page*

Name	TIC ID	Mag.	Sectors	CROWDSAP
HD_3191	284141111	8.13	17,18,58,85	0.969
HD_36408A	302824830	6.08	43,44,45,71	0.715
HD_95862	304996702	8.74	10,11,63,64,90	0.951
LS_II_+25_15	435781776	10.60	14,41,54,81	0.911
TYC_8170-690-1	75311623	10.41	62,63	0.868
V*_V379_Cep	277502552	6.04	15,16,17,55,56,57,75,76,77,82,84	0.990
*_I_Pup	126441970	3.70	34,61,88	0.996
CD-53.4543	288095171	8.86	11,64	0.946
HD_190603	106111735	5.08	14,54,55,74,75,81,82	0.990
HD_194279	13877074	5.84	14,15,41,75,81,82	0.928
HD_75860	29129672	6.72	62	0.932
V*_LN_Hya	228758232	6.09	10,37,64	0.999
V*_T_Cru	310883625	5.76	11,37,38,64,65	0.994
*_6_Cep	275420565	4.85	16,17,18,24,56,58,76,77,78,83,85	0.998
HD_213405	337886863	7.55	16,17,18,24,57,58,77,78,84,85	0.976
HD_237204	72696935	8.89	19,59,86	0.984
HD_34921	143681075	7.03	19,59,73,86	0.995
V*_V454_Vel	180730928	7.52	61,62	0.930

Table 6: Stellar Parameters of the used stars from the Variability Catalog of Stars Observed during the TESS Prime Mission (Fetherolf et al. (2023))

## 1.6 WD-IR

Name	TIC ID	Mag.	Sectors	CROWDSAP
BD+20_307	91373945	8.45	17,42,43,70,71	0.998
EC_05365-4759	220616055	15.87	31,32,33,87	0.592
GD_362	88844987	16.03	25,26,52,53,79,80	0.052
GD_85	17857475	15.07	60	0.307
HD_172555	464405850	4.62	66	0.990
PG_0843+517	142259188	16.33	20,47	0.614
SBSS_1612+554	207427565	16.01	16,23,24,25,49,50,51, 52,76,77,78,79	0.800
SCR_J0859-3647	191233258	15.43	62,89	0.394
Ton_345	184915712	16.13	44,46,72	0.808
UCAC4.077-007106	391923441	15.28	10,11,12,13,27,28,29,30, 31,32,33,34,36,37,38, 39,61,62,63,64,66,67, 68,69,87,88,89,90	0.210
UCAC4.207-006574	270576160	15.80	31,32,33,87	0.631
V*_KX_Dra	458484139	15.62	14,15,16,17,21,22,23,24, 41,47,48,50,51,54,57,74, 75,77,78,81,82,84	0.715
V*_ZZ_Psc	422526868	13.11	42,56,70	0.980

Table 7: Stellar Parameters of WD with IR excess from Farihi et al. (2025).

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