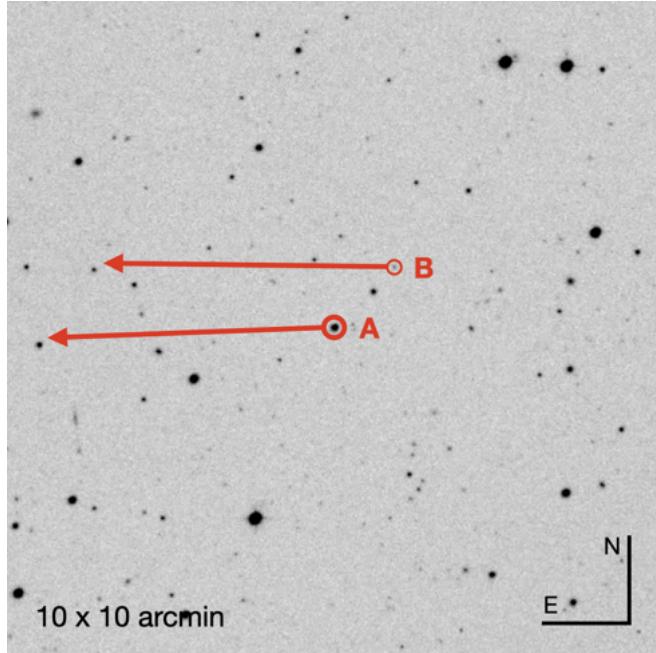


WDS 00212-4246 (KO 1)

A: LEHPM 494, Königstuhl 1A

B: 2MASS J00210589-4244433, Königstuhl 1B



	A-B	
WDS	KO 1	
ρ	77.77	arcsec
θ	316.9	deg
μ ratio	0.050	
ΔPA	2.8	deg
$\Delta d/d$	0.016	
d	26.79	pc
s	2083	au
P_{orb}	288	10^3 a
$-U_g^*$	7.33	10^{33} J

Component	A	B	
SpT	m5.5 V	L0.6: V	
α	00:21:11.11	00:21:06.29	
δ	-42:45:40.4	-42:44:43.5	
π	37.332 ± 0.038	37.93 ± 0.40	mas
$\mu_\alpha \cos \delta$	255.184 ± 0.031	257.82 ± 0.37	mas a^{-1}
μ_δ	-12.475 ± 0.039	-0.03 ± 0.39	mas a^{-1}
γ	...	+2 ± 1 ^a	km s^{-1}
G	15.3454 ± 0.0028	18.4345 ± 0.0062	mag
J	12.001 ± 0.022	13.521 ± 0.025	mag
L	15.47 ± 0.17	2.95 ± 0.11	$10^{-4}L_\odot$
T_{eff}	2900 ± 50	2200 ± 25	K
\mathcal{M}	0.109	0.0793	\mathcal{M}_\odot
RUWE	1.074	2.540	
Qflag 2MASS	AAA	AAA	
Qflag AllWISE	AAAU	AAAU	

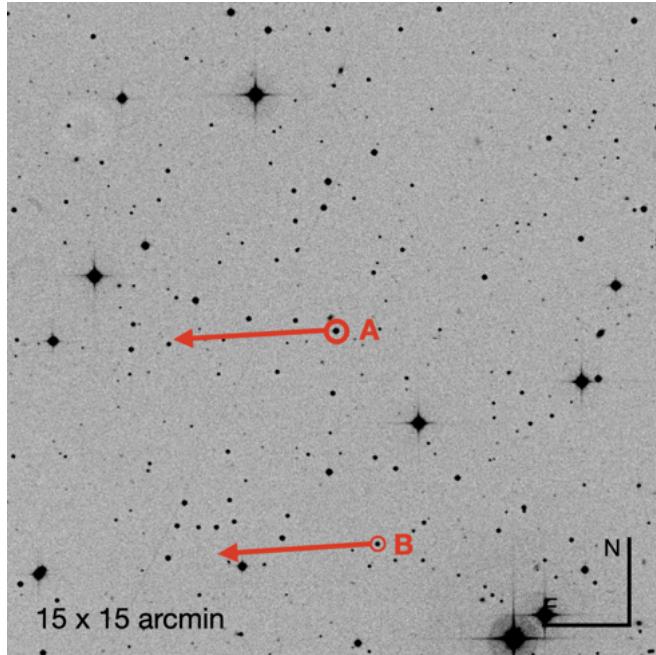
^a Mohanty & Basri 2003.

WDS 00212-4246 is a known physical pair of ultra-cool dwarfs (mid-M and early-L). The updated physical separation of 2083 au is wider than previously reported. This is the least massive pair in our sample, with a total mass of $0.19\mathcal{M}_\odot$. With a separation of 1.3 arcmin, it was dubbed as ‘the widest ultracool binary’ by Caballero et al. (2007). The authors also noted that confirming the binarity of the B component would help to support the hypothesis that wide triples are more prevalent than wide binaries. *Gaia* EDR3 RUWE value indicates, in fact, a probable multiplicity of the B component.

WDS 01568+3033 (KO 4)

A: NLTT 6496, Königstuhl 4A, Karmn J01567+305

B: NLTT 6491, Königstuhl 4B



	A-B	
WDS	KO 4	
ρ	299.1	arcsec
θ	190.6	deg
μ ratio	0.012	
ΔPA	0.027	deg
$\Delta d/d$	0.19	
d	31.40	pc
s	9392	au
P_{orb}	1699	10^3 a
$-U_g^*$	8.27	10^{33} J

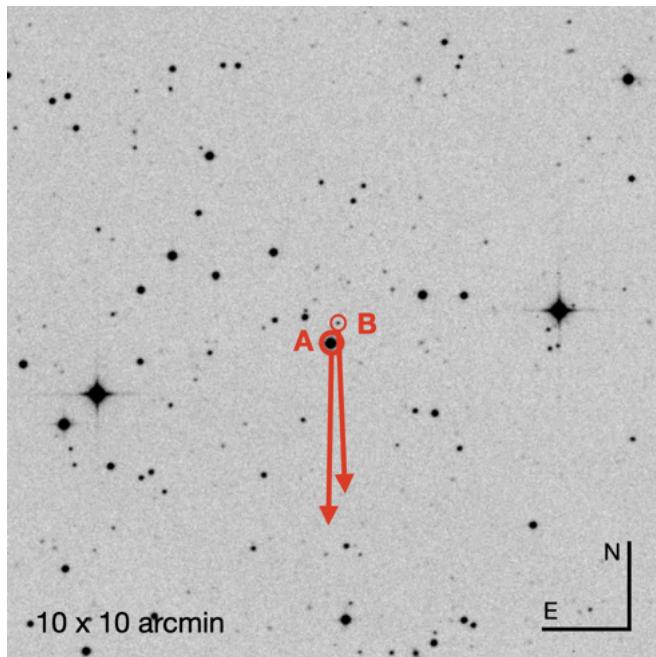
Component	A	B	
SpT	M4.5 V	m5 V	
α	01:56:45.99	01:56:41.74	
δ	+30:33:28.6	+30:28:34.6	
π	31.850 ± 0.076	26.645 ± 0.044	mas
$\mu_\alpha \cos \delta$	210.625 ± 0.092	208.183 ± 0.042	mas a^{-1}
μ_δ	-13.523 ± 0.090	-13.464 ± 0.044	mas a^{-1}
γ	km s^{-1}
G	13.5151 ± 0.0029	15.1596 ± 0.0028	mag
J	10.323 ± 0.023	11.917 ± 0.023	mag
L	98.6 ± 1.4	31.72 ± 0.46	$10^{-4} L_\odot$
T_{eff}	3100 ± 50	3100 ± 50	K
\mathcal{M}	0.287	0.153	\mathcal{M}_\odot
RUWE	4.582	1.109	
Qflag 2MASS	AAA	AAA	
Qflag AllWISE	AAAB	AAAAU	

WDS 01568+3033 (Königstuhl 4A and 4B) is a wide multiple system of two intermediate M dwarfs, and one of the least bound systems found (Caballero et al. 2012). *Gaia* EDR3 enlarges the distance given by the authors by more than 60%. While the pair complies with the proper motion criteria for physical parity, it exists a notable dissimilarity in distances, accompanied by an indication of poor astrometric quality. This high RUWE value of the primary is probably due to unresolved binarity, which affects the *Gaia* parallax determination.

WDS 04309-0849 (KO 2)

A: LP 655-23, Königstuhl 2A, Karmn J04308-088

B: DENIS J043051.5-084900, Königstuhl 2B



	A-B	
WDS	KO 2	
ρ	19.81	arcsec
θ	339.8	deg
μ ratio	0.053	
ΔPA	2.6	deg
$\Delta d/d$	0.038	
d	30.15	pc
s	597	au
P_{orb}	25.1	10^3 a
$-U_g^*$	93.8	10^{33} J

Component	A	B	
SpT	M4.0 V	M8 V	
α	04:30:52.04	04:30:51.58	
δ	-08:49:22.0	-08:49:03.5	
π	33.165 ± 0.061	31.95 ± 0.24	mas
$\mu_\alpha \cos \delta$	3.286 ± 0.069	-3.97 ± 0.23	mas a $^{-1}$
μ_δ	-161.794 ± 0.053	-157.29 ± 0.19	mas a $^{-1}$
γ	$+1.7 \pm 3.5^a$...	km s $^{-1}$
G	12.8742 ± 0.0028	17.4264 ± 0.0040	mag
J	9.853 ± 0.024	12.897 ± 0.022	mag
L	142.2 ± 1.9	7.10 ± 0.19	$10^{-4} L_\odot$
T_{eff}	3200 ± 50	2300 ± 25	K
\mathcal{M}	0.339	0.0936	\mathcal{M}_\odot
RUWE	3.370	1.687	
Qflag 2MASS	AAA	AAA	
Qflag AllWISE	AAAC	AAAU	

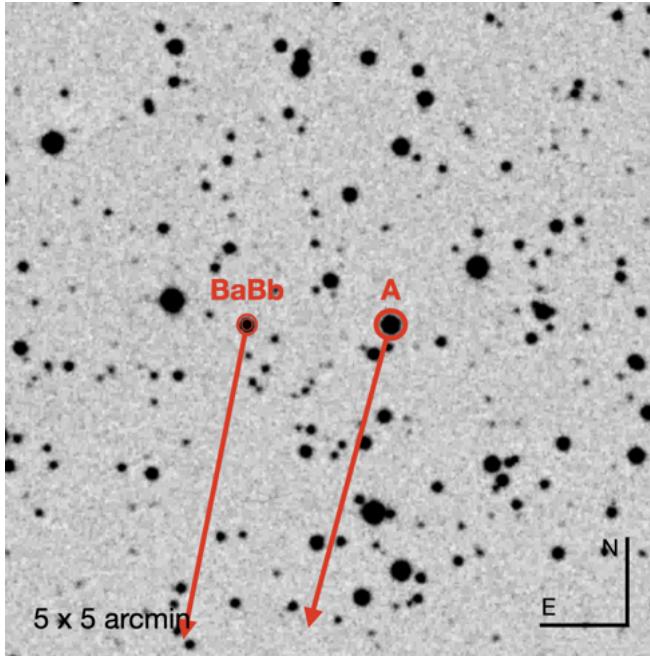
^a Terrien et al. 2015.

WDS 04309-0849 is a known physical pair of spectroscopically characterised ultra-cool dwarfs (mid- and late-M). The separation of almost 20 arcsec reported in *Gaia* EDR3 increases the projected separation calculated by Caballero et al. 2007. Their RUWE values suggest a possible binarity, at least for the brightest component.

WDS 06104+2234 (LAW 14 + New)

A: 2MASS J06101775+2234199, Karmn J06102+225

BaBb: LP 362-121, Karmn J06103+225



	A-BaBb	
WDS	...	
ρ	65.16	arcsec
θ	89.2	deg
μ ratio	0.060	
ΔPA	1.90	deg
$\Delta d/d$	0.20	
d	28.65	pc
s	1867	au
P_{orb}	143.3	10^3 a
$-U_g^*$	66.4	10^{33} J

Component	A	BaBb	
SpT	M4.0 V	M6 V + m7 V ^a	
α	06:10:17.81	06:10:22.52	
δ	+22:34:17.2	+22:34:18.1	
π	34.900 ± 0.028	43.9 ± 3.7^b	mas
$\mu_\alpha \cos \delta$	42.256 ± 0.033	39^c	mas a^{-1}
μ_δ	-153.057 ± 0.025	-162^c	mas a^{-1}
γ	-10.390 ± 9.806	$+9 \pm 4^d$	km s^{-1}
G	12.9716 ± 0.0029	14.1549 ± 0.0040	mag
J	9.876 ± 0.021	10.644 ± 0.022	mag
L	...	121.5 ± 1.5	$10^{-4} L_\odot$
T_{eff}	...	3100 ± 50	K
\mathcal{M}	0.289	0.222	\mathcal{M}_\odot
RUWE	1.402	...	
Qflag 2MASS	AAA	AAA	
Qflag AllWISE	AAAC	AAAC	

^a From upper limits given by Law et al. 2008.

^b Dittman et al. 2014.

^c Lépine et al. 2005.

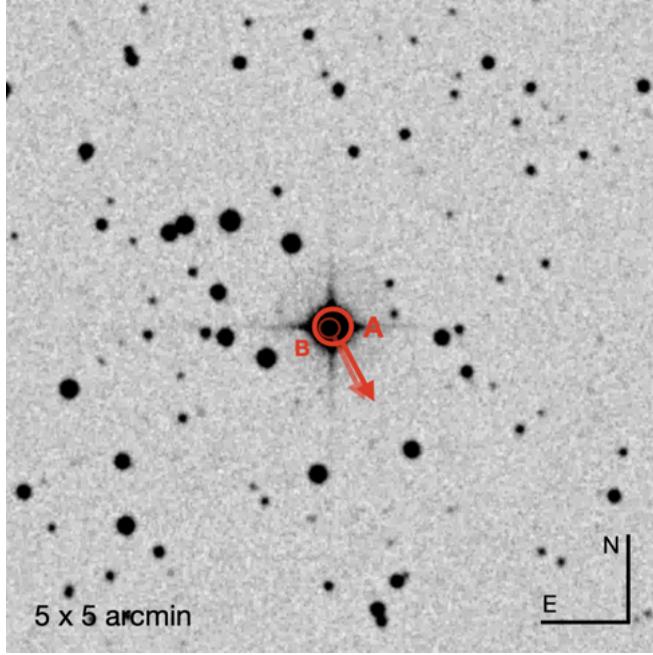
^d Newton et al. 2014.

Karmn J06102+225 and LP 362-121 are two nearby mid-M dwarfs, the latter resolved to be a close binary (LAW 14; Law et al. 2008), and the former having a visual (non-physical) companion in the background (Janson et al. 2014). We redefine this system as triple. Next *Gaia* releases might determine more accurately the parameters for the BaBb components, for which we compiled data from several sources from the literature.

New

A: BD+37 1541

B: Gaia DR2 943408949754423680



	A-B	
ρ	3.88	arcsec
θ	201.5	deg
μ ratio	0.016	
ΔPA	0.70	deg
$\Delta d/d$	0.0072	
d	218.8	pc
s	849	au
P_{orb}	19.5	10^3 a
$-U_g^*$	1306	10^{33} J

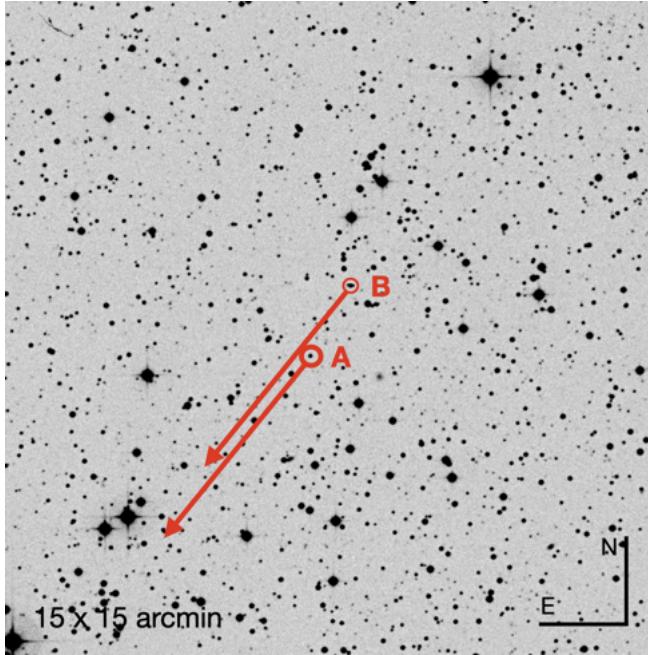
Component	A	B	
SpT	f0: V	m2.5 V	
α	06:35:38.65	06:35:38.53	
δ	+37:51:13.6	+37:51:10.0	
π	4.569 ± 0.019	4.60 ± 0.11	mas
$\mu_\alpha \cos \delta$	-11.831 ± 0.018	-11.69 ± 0.13	mas a^{-1}
μ_δ	-19.999 ± 0.015	-20.333 ± 0.107	mas a^{-1}
γ	$+0.7 \pm 1.6$...	km s^{-1}
G	9.1409 ± 0.0028	16.439 ± 0.019	mag
J	8.342 ± 0.023	...	mag
L	79030 ± 1750	...	$10^{-4} L_\odot$
T_{eff}	6400 ± 50	...	K
\mathcal{M}	1.61	0.391	\mathcal{M}_\odot
RUWE	0.905	1.099	
Qflag 2MASS	AAA	...	
Qflag AllWISE	AAAB	...	

BD+37 1541 is an early-F star (estimated by us) in which vicinity *Gaia* EDR3 resolves a physical companion candidate at 3.9 arcsec that is seven magnitudes fainter in the G passband, but shares similar proper motions and parallactic distances. The brightness of the very close primary strongly limits the characterisation of the early-M-dwarf secondary.

WDS 06511+1844 (FMR 83)

A: LSPM J0651+1843

B: LSPM J0651+1845



	A-B	
WDS	FMR 83	
ρ	111.7	arcsec
θ	330.6	deg
μ ratio	0.0020	
ΔPA	0.016	deg
$\Delta d/d$	0.0028	
d	63.85	pc
s	7133	au
P_{orb}	1461	10^3 a
$-U_g^*$	7.11	10^{33} J

Component	A	B	
SpT	m4.5 V	m4.5 V	
α	06:51:00.84	06:51:04.70	
δ	+18:45:16.1	+18:43:38.7	
π	15.662 ± 0.050	15.617 ± 0.052	mas
$\mu_\alpha \cos \delta$	199.532 ± 0.048	199.078 ± 0.055	mas a^{-1}
μ_δ	-244.131 ± 0.040	-243.713 ± 0.043	mas a^{-1}
γ	km s^{-1}
G	15.9303 ± 0.0029	15.9455 ± 0.0029	mag
J	12.981 ± 0.021	12.983 ± 0.023	mag
L	37.94 ± 0.92	37.65 ± 0.95	$10^{-4} L_\odot$
T_{eff}	3100 ± 50	3100 ± 50	K
M	0.170	0.169	M_\odot
RUWE	1.057	1.068	
Qflag 2MASS	AAA	AAA	
Qflag AllWISE	AABU	AABU	

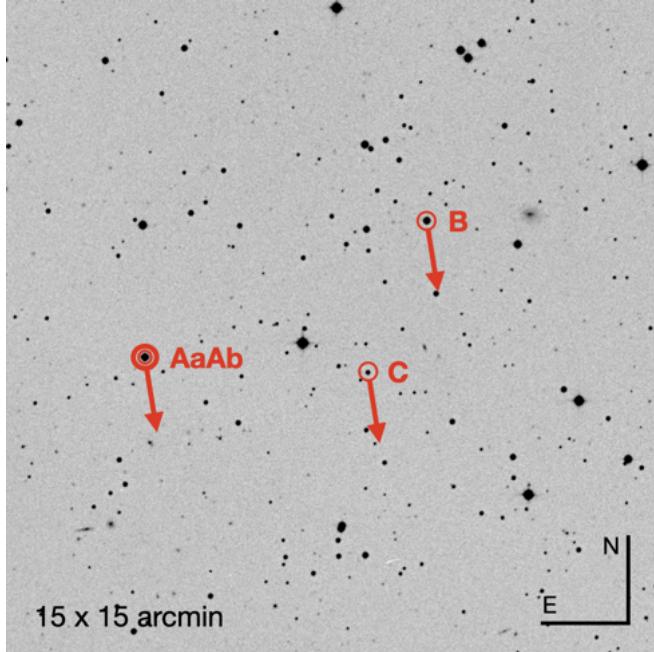
LSPM J0651+1843 and LSPM J0651+1845 are the components of a known binary system (FMR 83) of mid-M dwarfs. Spectral types of both stars photometrically estimated by us. [Rica and Caballero \(2012\)](#) characterised this pair and described it as an ‘ultrafragile’ system. In this work we refine their parameters with the *Gaia* EDR3 solution, and also redefine the nomenclature of their components based on their bolometric luminosity (and G band magnitude).

New

AaAb: 1RXS J073138.4+455718

B: 2MASS J07310905+4556573, Karmn J07310+460

C: PYC J07311+4556



	AaAb-B	AaAb-C	
WDS	
ρ	431.4	307.8	arcsec
θ	296.0	266.3	deg
μ ratio	0.086	0.079	
ΔPA	0.76	1.5	deg
$\Delta d/d$	0.014	0.028	
d	55.93		pc
s	24127	17215	au
P_{orb}	4217	2542	10^3 a
$-U_g^*$	17.5	11.2	10^{33} J

Component	AaAb	B	C	
SpT	M3 + m4.5 V ^a	M4.0 V	m4.5 V	
α	07:31:38.47	07:31:01.27	07:31:09.03	
δ	+45:57:15.8	+46:00:24.8	+45:56:55.6	
π	17.88 ± 0.42	18.141 ± 0.052	18.388 ± 0.034	mas
$\mu_\alpha \cos \delta$	-13.69 ± 0.39	-13.516 ± 0.059	-12.167 ± 0.034	mas a^{-1}
μ_δ	-92.77 ± 0.28	-100.846 ± 0.034	-99.999 ± 0.024	mas a^{-1}
γ	km s^{-1}
G	12.7665 ± 0.0083	12.8963 ± 0.0029	15.2193 ± 0.0030	mag
J	9.776 ± 0.021	9.948 ± 0.023	11.898 ± 0.022	mag
L	...	445.8 ± 7.1	65.1 ± 1.1	$10^{-4} L_\odot$
T_{eff}	...	3200 ± 50	3100 ± 50	K
M	0.789	0.504	0.231	M_\odot
RUWE	20.805	2.230	1.105	
Qflag 2MASS	AAA	AAA	AAA	
Qflag AllWISE	AAAB	AAAB	AAAU	

^a From the difference in magnitudes reported in JNN 58.

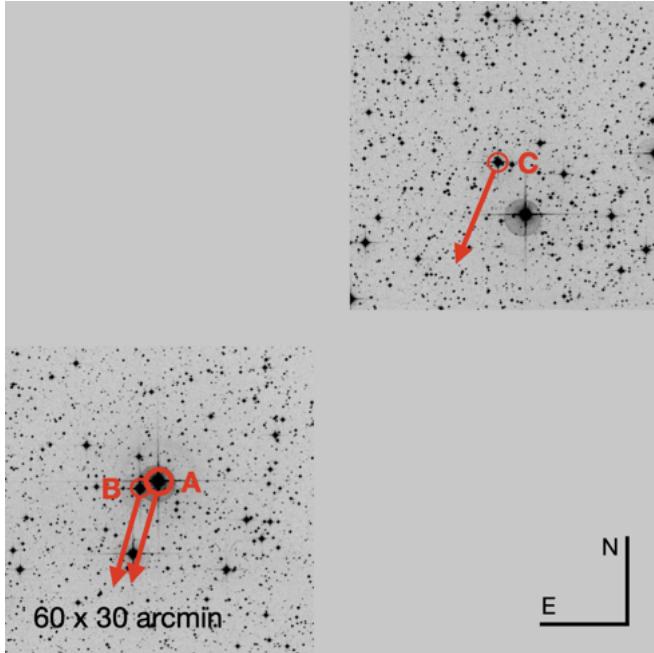
Since the primary of this trio of early-to-mid M dwarfs is a 0.2-arcsec close binary (JNN 58; [Janson et al. 2014](#)), this is a quadruple system. Components B and C are separated about 431 and 308 arcsec from the primary, respectively. Remarkably, the C component is PYC J07311+4556, a young candidate member in the β Pictoris moving group as reported by [Schlieder et al. \(2012\)](#). For this reason, for the B component we report bolometric luminosity and effective temperature values not in agreement with the expected figures for the main sequence. Additionally, its large RUWE value might be indicative of a non-resolved companion, in which case the system would turn out to be quintuple.

WDS 07400-0336 (BGH 3 + New)

A: HD 61606 A

B: HD 61606 B

C: BD-02 2198, Karmn J07361-031



	A-B	A-C	
WDS	BGH 3	...	
ρ	57.9	3894	arcsec
θ	112.7	296.7	deg
μ ratio	0.033	0.054	
ΔPA	1.18	0.049	deg
$\Delta d/d$	0.00056	0.011	
d		14.08	pc
s	815	54823	au
P_{orb}	26.6	10907	10^3 a
$-U_g^*$	1026	24.4	10^{33} J

Component	A	B	C	
SpT	K3 V	K7 V	M1.0 V	
α	07:39:59.40	07:40:02.97	07:36:07.15	
δ	-03:35:55.5	-03:36:17.8	-03:06:43.4	
π	71.032 ± 0.024	70.992 ± 0.025	70.27 ± 0.13	mas
$\mu_\alpha \cos \delta$	70.078 ± 0.024	66.008 ± 0.024	74.129 ± 0.144	mas a^{-1}
μ_δ	-278.117 ± 0.019	-286.706 ± 0.020	-293.118 ± 0.095	mas a^{-1}
γ	-18.35 ± 0.18	-19.01 ± 0.19	-17.19 ± 0.37	km s^{-1}
G	6.8898 ± 0.0028	8.3347 ± 0.0028	9.1424 ± 0.0029	mag
J	5.493 ± 0.027	6.377 ± 0.024	6.791 ± 0.034	mag
L	608.8 ± 9.4	$10^{-4} L_\odot$
T_{eff}	3700 ± 50	K
\mathcal{M}	0.766	0.619	0.547	\mathcal{M}_\odot
RUWE	1.065	1.022	6.531	
Qflag 2MASS	EAA	AAA	AAA	
Qflag AllWISE	BBA	BAAA	AAAA	

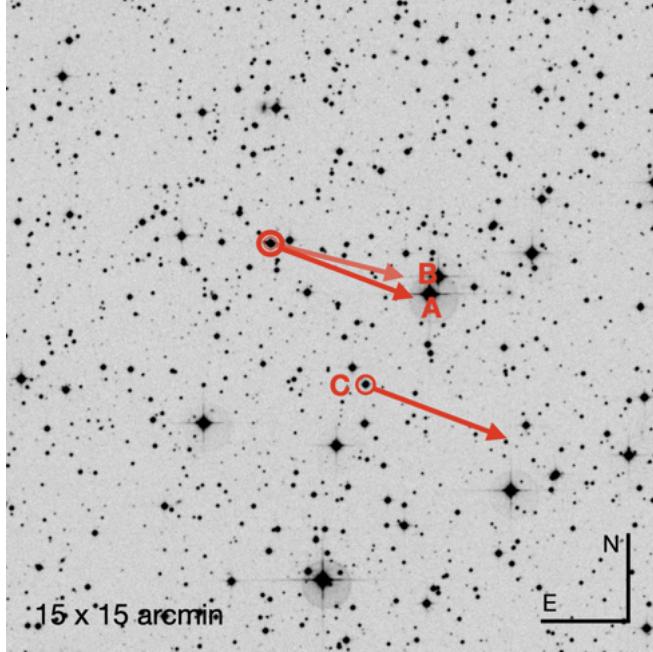
WDS 07400-0336 is a known pair of K dwarfs with a projected physical separation of 815 au. [Poveda et al. \(2009\)](#) found that the wide early-M dwarf BD-02 2198 is an co-eval, co-moving and equi-distant companion of this pair. [Ishikawa et al. \(2020\)](#) concluded that this object was not a member of the system, based on the study of escape velocities and chemical abundances (from [Montes et al. 2018](#)). However, the large value of the RUWE indicator of C points towards unresolved binarity, in which case the system would be quadruple (i.e. a binary of binaries). This is the closest system of our sample (14.1 pc), but also the most separated one (55 000 au).

New

A: 1RXS J074948.5-031712

B: 2MASS J07495087-0317194

C: 2MASS J07494215-0320338, Karmn J07497-033



	A-B	A-C	
WDS	
ρ	1.936	234.9	arcsec
θ	266.3	214.0	deg
μ ratio	0.24	0.084	
ΔPA	5.48	1.56	deg
$\Delta d/d$	0.0004	0.015	
d		17.04	pc
s	32.82	4002	au
P_{orb}	332.7	327	10^3 a
$-U_g^*$	4832	81.4	10^{33} J

Component	A	B	C	
SpT	M3.5 V	m4: V	M3.5 V	
α	07:49:50.75	07:49:50.62	07:49:41.97	
δ	-03:17:20.3	-03:17:20.4	-03:20:34.9	
π	58.683 ± 0.047	58.658 ± 0.045	57.83 ± 0.15	mas
$\mu_\alpha \cos \delta$	-174.257 ± 0.044	-139.058 ± 0.046	-161.90 ± 0.14	mas a^{-1}
μ_δ	-65.329 ± 0.033	-37.451 ± 0.040	-55.71 ± 0.11	mas a^{-1}
γ	-24.2 ± 5.1^a	km s^{-1}
G	11.5510 ± 0.0028	11.9199 ± 0.0028	11.8027 ± 0.0028	mag
J	8.039 ± 0.030	...	8.891 ± 0.027	mag
L	113.8 ± 1.7	$10^{-4} L_\odot$
T_{eff}	3200 ± 50	K
M	0.3195	0.2814	0.3074	M_\odot
RUWE	1.575	1.744	5.936	
Qflag 2MASS	AAA	...	AAA	
Qflag AllWISE	AAAA	...	AAAA	

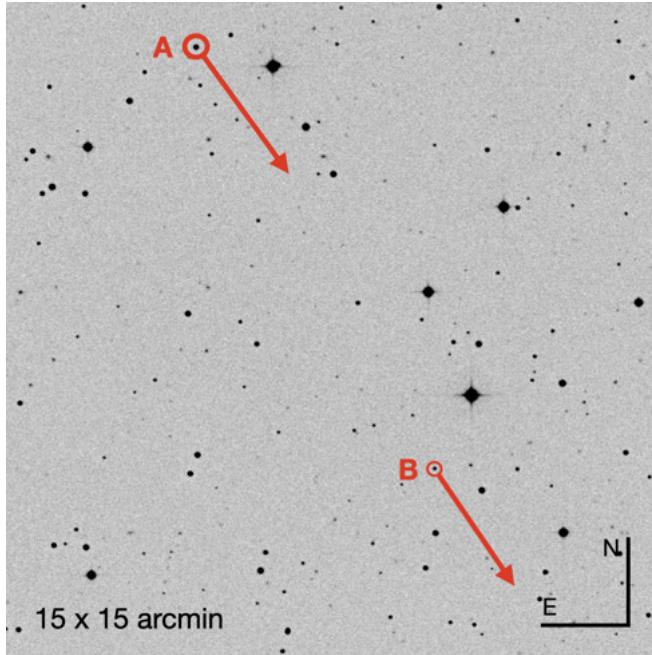
^a Terrien et al. 2015.

At less than 2 arcsec of the M3.5-dwarf 1RXS J074948.5-031712, *Gaia* EDR3 resolves a source of similar apparent brightness that is equidistant and co-moving. Although its μ ratio exceeds the limit set by our criteria for physical parity, we expect this deviation due to the closeness of the pair (less than 2 arcsec). Separated 235 arcsec from this pair is Karmn J07498-033, which astrometry is indicative of physical connection with the primary. Additionally, the large value of its RUWE indicator suggests an additional binarity for this star, meaning that the entire system would be quadruple.

WDS 08371+3908 (KO 6)

A: LP 209-28, Königstuhl 6A

B: LP 209-27, Königstuhl 6B



	A-B	
WDS	KO 6	
ρ	666.7	arcsec
θ	208.5	deg
μ ratio	0.034	
ΔPA	0.37	deg
$\Delta d/d$	0.43	
d	104.7	pc
s	69837	au
P_{orb}	31557	10^3 a
$-U_g^*$	2.26	10^{33} J

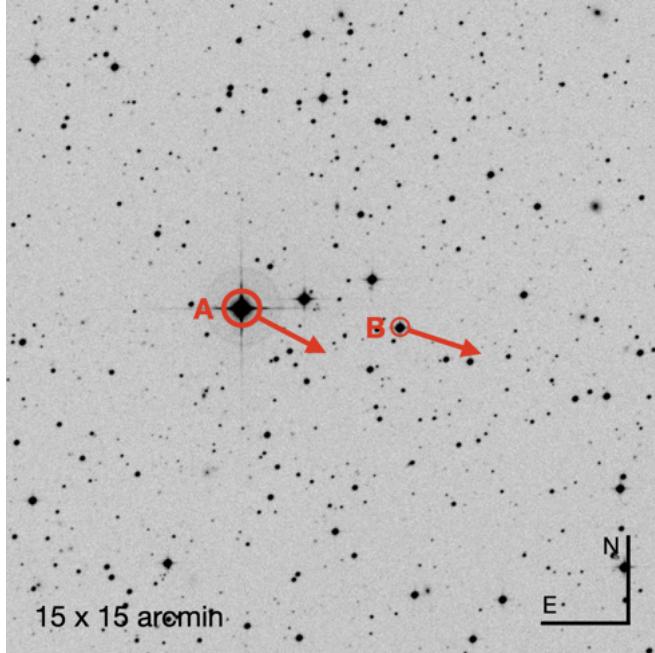
Component	A	B	
SpT	m3: V	m4: V	
α	08:37:04.54	08:36:37.28	
δ	+39:07:56.9	+38:58:10.7	
π	9.546 ± 0.027	6.688 ± 0.069	mas
$\mu_\alpha \cos \delta$	-119.169 ± 0.027	-116.409 ± 0.065	mas a^{-1}
μ_δ	-186.435 ± 0.023	-179.564 ± 0.052	mas a^{-1}
γ	km s^{-1}
G	15.0067 ± 0.0028	16.8107 ± 0.0029	mag
J	12.816 ± 0.022	14.009 ± 0.026	mag
L	144.8 ± 2.1	81.8 ± 3.2	$10^{-4} L_\odot$
T_{eff}	3700 ± 50	3200 ± 50	K
M	0.342	0.261	M_\odot
RUWE	1.042	0.964	
Qflag 2MASS	AAA	AAA	
Qflag AllWISE	AABU	AAUU	

LP 209-28 and LP 209-27 (KO6 AB) is a pair proposed as a binary system by [Caballero et al. \(2012\)](#). *Gaia* EDR3 introduces a notable dissimilarity in distance between components, accompanied by a good single-star model fitting (i.e. RUWE < 1.4). This means that we do not expect additional multiplicity in either component, and the difference in parallactic determination would not be the cause of close, unresolved companions. We find that the separation of ρ during 10 epochs of observation spanning 62 years increases by 0.248 arcsec (4 milliarcsecond per year). Therefore, we propose this system as a visual pair.

New

A: HD 77825

B: 1RXS J090406.8-155512, Karmn J09040-159



	A-B	
WDS	...	
ρ	220.0	arcsec
θ	262.9	deg
μ ratio	0.020	
ΔPA	0.71	deg
$\Delta d/d$	0.0032	
d	27.39	pc
s	6026	au
P_{orb}	538	10^3 a
$-U_g^*$	93.4	10^{33} J

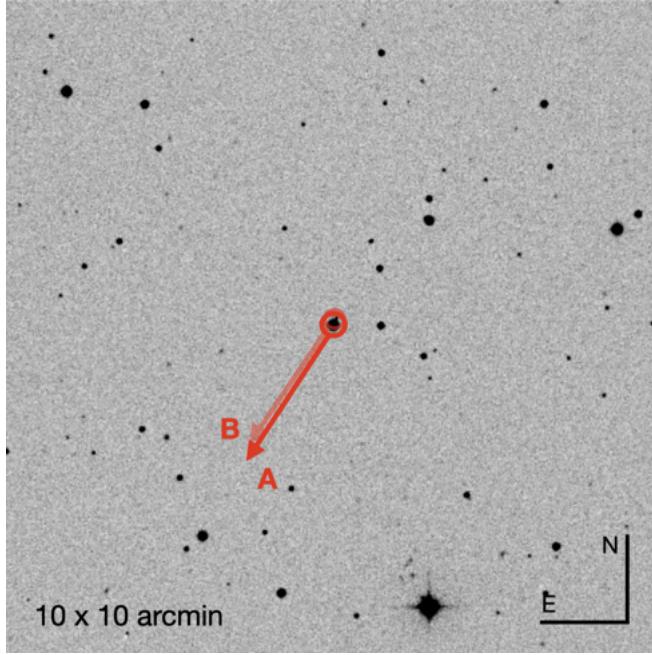
Component	A	B	
SpT	K2 V	M2.5 V	
α	09:04:20.57	09:04:05.44	
δ	-15:54:51.8	-15:55:19.0	
π	36.512 ± 0.022	36.628 ± 0.022	mas
$\mu_\alpha \cos \delta$	-107.828 ± 0.083	-109.034 ± 0.072	mas a^{-1}
μ_δ	-30.936 ± 0.079	-32.638 ± 0.076	mas a^{-1}
γ	$+4.39 \pm 0.24$	$+4.44 \pm 0.33$	km s^{-1}
G	8.4640 ± 0.0028	11.7538 ± 0.0029	mag
J	7.005 ± 0.024	9.156 ± 0.026	mag
L	2601 ± 28	250.1 ± 3.1	$10^{-4} L_\odot$
T_{eff}	4800 ± 50	3400 ± 50	K
M	0.756	0.422	M_\odot
RUWE	1.002	1.114	
Qflag 2MASS	AAA	AAA	
Qflag AllWISE	AAAA	AAAB	

HD 77825 and 1RXS J090406.8-155512 (Karmn J09040-159) form a physical pair of spectroscopically-derived K2 V and M2.5 V stars located at less than 30 pc. All astrometric measurements from *Gaia* EDR3 support the binarity, including their radial velocities from *Gaia* DR2.

New

A: 2MASS J13181352+7322073, Karmn J13182+733

B: Gaia DR2 1688578285187648128



	A-B	
WDS	...	
ρ	7.39	arcsec
θ	155.7	deg
μ ratio	0.065	
ΔPA	1.01	deg
$\Delta d/d$	0.007	
d	25.29	pc
s	187	au
P_{orb}	4.38	10^3 a
$-U_g^*$	297	10^{33} J

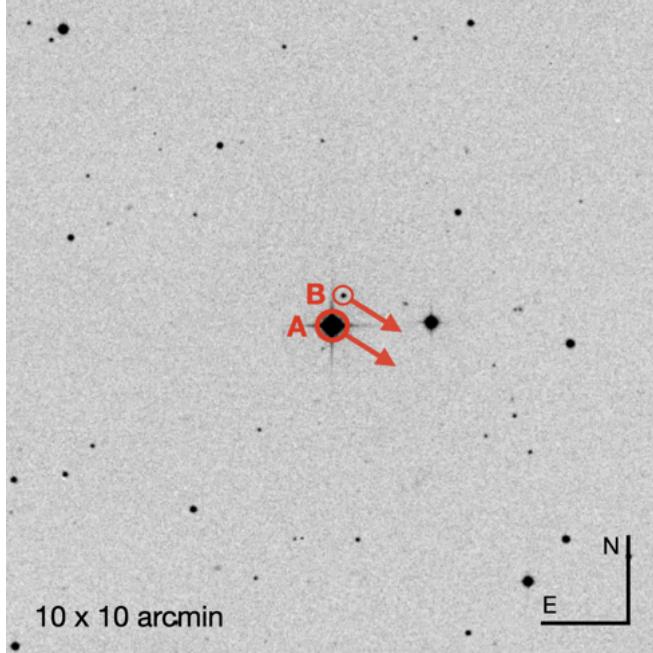
Component	A	B	
SpT	M3.5 V	m7 V	
α	13:18:13.82	13:18:13.11	
δ	+73:22:05.6	+73:22:12.4	
π	39.534 ± 0.021	39.276 ± 0.098	mas
$\mu_\alpha \cos \delta$	72.055 ± 0.027	70.05 ± 0.11	mas a^{-1}
μ_δ	-107.549 ± 0.027	-100.69 ± 0.12	mas a^{-1}
γ	km s^{-1}
G	12.3962 ± 0.0028	16.9130 ± 0.0030	mag
J	9.541 ± 0.022	12.660 ± 0.025	mag
L	143.2 ± 1.3	6.20 ± 0.17	$10^{-4} L_\odot$
T_{eff}	3300 ± 50	2500 ± 50	K
\mathcal{M}	0.340	0.092	\mathcal{M}_\odot
RUWE	1.422	0.814	
Qflag 2MASS	AAA	ABA	
Qflag AllWISE	AAAB	...	

Karmn J13182+733 is an M3.5 V star with a resolved companion at 7.4 arcsec (187 au) to the south. The astrometry of this companion indicates a physical relation to the primary, and its photometry and empirically derived parameters are compatible with a mid- to late-M dwarf.

New

A: HD 130666

B: 2MASS J14474531+4934020



	A-B	
WDS	...	
ρ	29.54	arcsec
θ	336.6	deg
μ ratio	0.051	
ΔPA	21.5	deg
$\Delta d/d$	0.0066	
d	104.0	pc
s	3072	au
P_{orb}	146	10^3 a
$-U_g^*$	130	10^{33} J

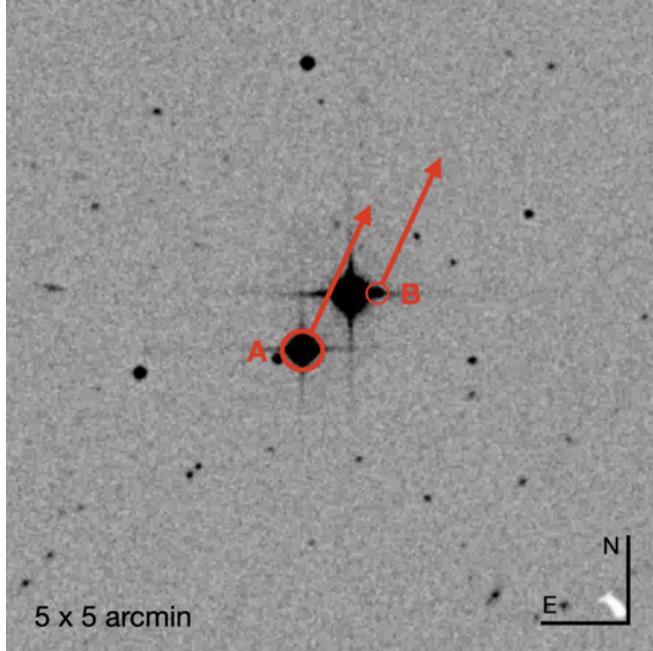
Component	A	B	
SpT	G5	m4.5 V	
α	14:47:46.40	14:47:45.19	
δ	+49:33:34.1	+49:34:01.2	
π	9.614 ± 0.033	9.551 ± 0.069	mas
$\mu_\alpha \cos \delta$	-63.589 ± 0.032	-62.076 ± 0.068	mas a $^{-1}$
μ_δ	-51.374 ± 0.038	-47.446 ± 0.081	mas a $^{-1}$
γ	-50.165 ± 0.179	...	km s $^{-1}$
G	8.4416 ± 0.0028	17.2739 ± 0.0030	mag
J	7.031 ± 0.030	14.032 ± 0.028	mag
L	38260 ± 9487	36.85 ± 1.14	$10^{-4} L_\odot$
T_{eff}	4900 ± 50	3000 ± 50	K
M	1.36	0.167	M_\odot
RUWE	2.094	1.123	
Qflag 2MASS	AAF	AAA	
Qflag AllWISE	AAAA	AABU	

HD 130666 is a bright Sun-like star with mid-M dwarf physical companion separated by 29.5 arsec. The components are well-characterised, both astrometric and photometrically, in *Gaia* EDR3. The RUWE indicator in the primary is higher than expected for a single-star model fit.

New

A: TYC 2565-684-1

B: 2MASS J15080798+3310222



	A-B	
WDS	...	
ρ	43.64	arcsec
θ	306.2	deg
μ ratio	0.0041	
ΔPA	0.23	deg
$\Delta d/d$	0.0054	
d	198.1	pc
s	8644	au
P_{orb}	787	10^3 a
$-U_g^*$	79.1	10^{33} J

Component	A	B	
SpT	g1 V	m3 V	
α	15:08:10.72	15:08:07.92	
δ	+33:09:57.8	+33:10:23.6	
π	5.048 ± 0.019	5.021 ± 0.061	mas
$\mu_\alpha \cos \delta$	-39.926 ± 0.015	-40.224 ± 0.050	mas a^{-1}
μ_δ	77.094 ± 0.018	76.905 ± 0.063	mas a^{-1}
γ	-19.2 ± 3.4	...	km s^{-1}
G	10.9314 ± 0.0028	16.9843 ± 0.0028	mag
J	9.895 ± 0.020	14.081 ± 0.037	mag
L	11814 ± 152	128.2 ± 5.3	$10^{-4} L_\odot$
T_{eff}	5700 ± 50	3200 ± 50	K
\mathcal{M}	1.04	0.324	M_\odot
RUWE	1.499	1.043	
Qflag 2MASS	AAA	AAA	
Qflag AllWISE	AAAC	...	

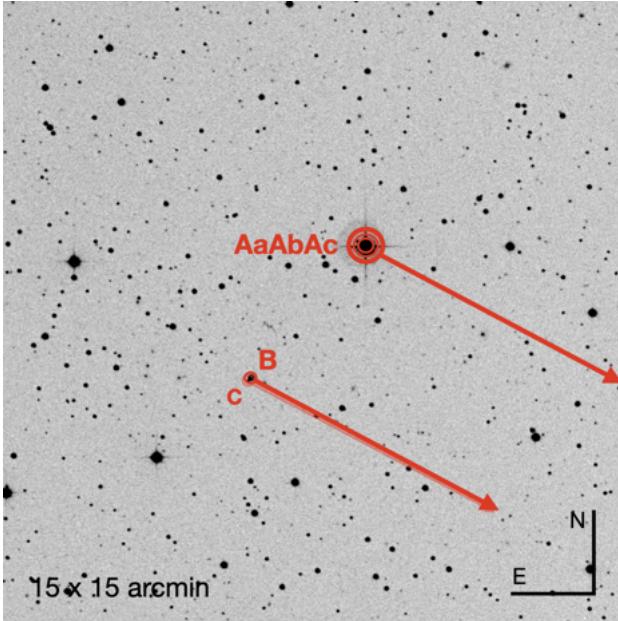
TYC 2565-684-1 is a bright dwarf, estimated to be of early-G type, with a fainter companion that we classify photometrically as m3 V. The pair complies with the conditions for physical parity. It is located 13 arcsec westward from the bright background star BD+33 2544 ($G \sim 9.8$ mag).

WDS 16329+0315 (DSG 7 + LEP 79 + DAM 649)

AaAbAc: HD 149162

B: G 17-23, Karmn J16330+031

C: LSPM J1633+0311S



	AaAbAc-BC	
WDS	LEP 79	
ρ	252.0	arcsec
θ	138.4	deg
μ ratio	0.013	
ΔPA	0.67	deg
$\Delta d/d$	0.0015	
d	45.25	pc
s	11406	au
P_{orb}	959	10^3 a
$-U_g^*$	121.0	10^{33} J

Component	AaAbAc	B	C	
SpT	K0 Ve + k5 V + m5 V	M3.0 V	D:	
α	16:32:51.24	16:33:02.42	16:33:02.71	
δ	+03:14:42.8	+03:11:34.4	+03:11:29.7	
π	22.09 ± 0.52	22.130 ± 0.016	22.01 ± 0.11	mas
$\mu_\alpha \cos \delta$	-373.83 ± 0.51	-369.147 ± 0.017	-369.41 ± 0.13	mas a^{-1}
μ_δ	-183.10 ± 0.48	-186.158 ± 0.014	-189.69 ± 0.11	mas a^{-1}
γ	-64.1 ± 7.3	km s^{-1}
G	8.5855 ± 0.0028	13.3872 ± 0.0028	17.7936 ± 0.0030	mag
J	7.159 ± 0.024	10.625 ± 0.026	16.31 ± 0.28	mag
L	...	167.0 ± 2.0	...	$10^{-4} L_\odot$
T_{eff}	...	3300 ± 50	...	K
\mathcal{M}	$0.87 + 0.68 + 0.19$	0.363	0.0985	\mathcal{M}_\odot
RUWE	28.569	1.145	0.997	
Qflag 2MASS	AAA	AAA	DDU	
Qflag AllWISE	AAAA	AAAC	...	

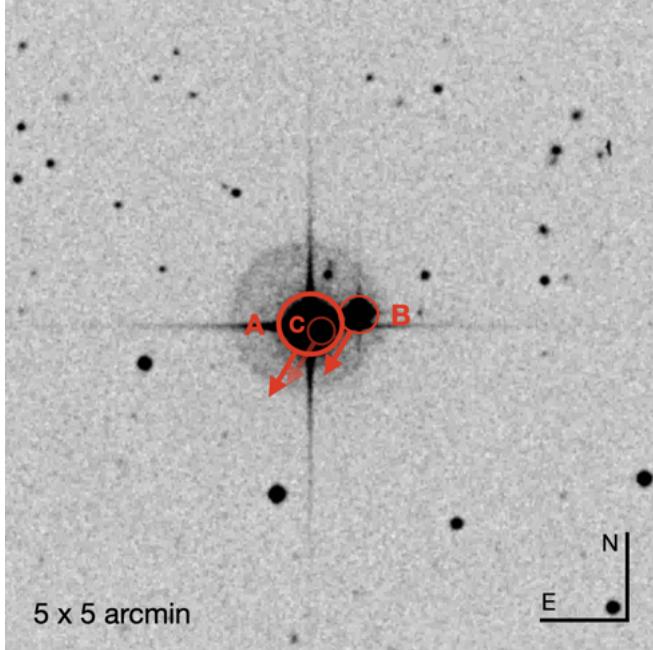
From the triple system HD 149162 (AaAbAc, DSG 7), the component Aa is spectroscopically classified as an early-K dwarf. We estimate photometrically the spectral types of Ab and Ac. At 252 arcsec from A, the M3 V G 17-23 (Karmn J16330+031) was reported to be a physical companion of the triple system (LEP 79). For this M dwarf, a close companion named LSPM J1633+0311S was additionally found at 6.4 arcsec (DAM 649), and classified as a white dwarf by [Montes et al. \(2018\)](#). Three of the five components are resolved by *Gaia* EDR3 and 2MASS. [González-Peinado et al. \(2018\)](#) described this system in detail with the astrometry from *Gaia* DR1. We revisit this quintuple system with the latest astrometry from *Gaia* EDR3.

WDS 15092+3304 (HJ 566 + New)

A: HD 134494

B: BD+33 2548 B

C: Gaia DR2 1288848427727490048



	A-B	A-C	
WDS	HJ 566	...	
ρ	23.4	5.85	arcsec
θ	285.0	180.3	deg
μ ratio	0.0089	0.0066	
ΔPA	0.46	0.21	deg
$\Delta d/d$	0.0063	0.12	
d		276.1	pc
s	6456	1615	au
P_{orb}	314	42.1	10^3 a
$-U_g^*$	837	907	10^{33} J

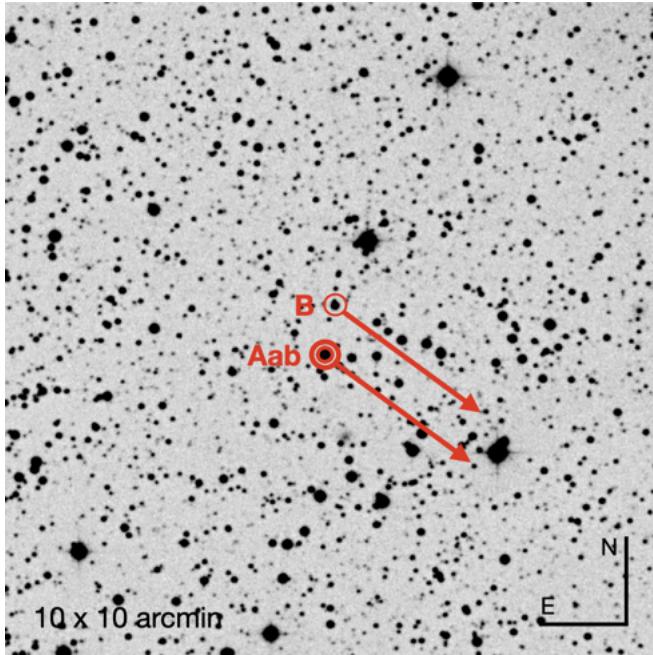
Component	A	B	C	
SpT	K0 IV	f9 V	m3 V	
α	15:09:09.91	15:09:08.11	15:09:09.91	
δ	+33:03:37.4	+33:03:43.4	+33:03:31.5	
π	3.622 \pm 0.021	3.645 \pm 0.019	4.12 \pm 0.10	mas
$\mu_\alpha \cos \delta$	13.284 \pm 0.015	13.423 \pm 0.015	11.27 \pm 0.11	mas a $^{-1}$
μ_δ	-23.059 \pm 0.020	-22.866 \pm 0.019	-24.23 \pm 0.11	mas a $^{-1}$
γ	+0.15 \pm 0.13	+0.02 \pm 0.61	...	km s $^{-1}$
G	8.0455 \pm 0.0028	11.2661 \pm 0.0028	17.0507 \pm 0.0055	mag
J	6.511 \pm 0.021	10.359 \pm 0.021	...	mag
L	391600 \pm 10700	16294 \pm 307	...	$10^{-4} L_\odot$
T_{eff}	4800 \pm 50	6100 \pm 50	...	K
M	2.55	1.12	0.349	M_\odot
RUWE	1.011	1.172	1.343	
Qflag 2MASS	AAA	AAA	...	
Qflag AllWISE	BAAA	AAAB	...	

HD 134494 (K0, Cannon et al 1993) has a known physical companion, BD+33 2548B, which we estimate to be a late-F dwarf or early-G. We propose a second candidate to physical companion resolved by *Gaia* at 5.9 arcsec from the primary and 9 mag fainter in G, which we estimate it to be an m3 V star. Based on the bolometric luminosity and the absolute brightnesses in G and J, we propose a new classification of the primary as subgiant.

WDS 19312+3607 (GIC 158)

Aab: G 125-15

B: G 125-14, Karmn J19312+361AB



	Aab-B	
WDS	GIC 158	
ρ	45.78	arcsec
θ	347.4	deg
μ ratio	0.0085	
ΔPA	0.461	deg
$\Delta d/d$	0.00072	
d	40.08	pc
s	1835	au
P_{orb}	101.9	10^3 a
$-U_g^*$	160.4	10^{33} J

Component	Aab	B	
SpT	M4.5 V + M5 ^a	M4.5 V	
α	19:31:12.38	19:31:11.56	
δ	+36:07:28.2	+36:08:12.8	
π	24.948 ± 0.022	24.966 ± 0.015	mas
$\mu_\alpha \cos \delta$	-129.778 ± 0.022	-130.266 ± 0.015	mas a ⁻¹
μ_δ	-106.444 ± 0.026	-105.102 ± 0.018	mas a ⁻¹
γ	-22.31 ± 1.24^a	...	km s ⁻¹
G	12.6849 ± 0.0029	13.9120 ± 0.0028	mag
J	9.609 ± 0.022	10.924 ± 0.022	mag
L	...	93.92 ± 0.94	$10^{-4} L_\odot$
T_{eff}	...	3200 ± 50	K
M	$0.40 + 0.19$	0.280	M_\odot
RUWE	1.358	1.203	
Qflag 2MASS	AAA	AAA	
Qflag AllWISE	AAAB	AAAU	

^a Shkolnik et al. 2010.

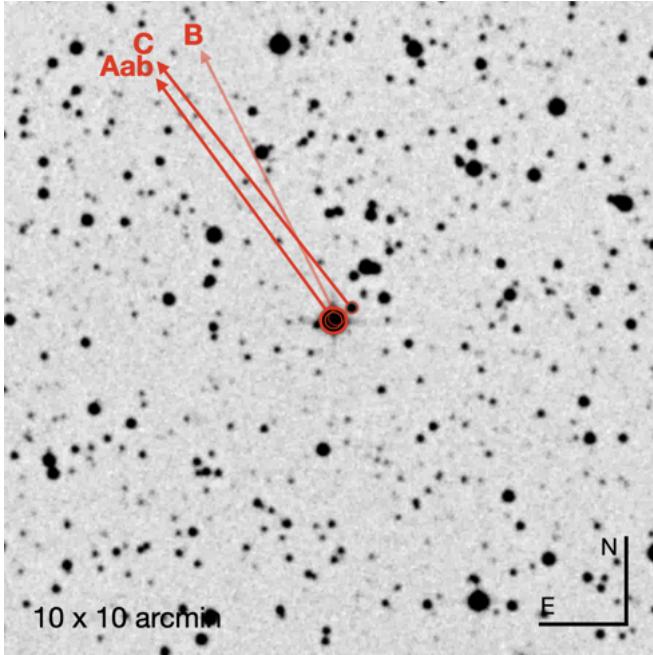
G 125-15 is an active (Reid et al. 2004) mid-M-dwarf and double-lined spectroscopic binary (Shkolnik et al. 2010), with a known physical companion at 1835 au. The trio was investigated in detail by Caballero et al. (2010). In particular, they studied the age of the system and ruled out previous determinations of youth. Their photometrically estimated distance, as well as other previous determinations, are substantially different from the latest trigonometric value from *Gaia* EDR3, which in turn enlarges the physical separation up to 1835 au.

WDS 20198+2257 (KPP 4191 + New)

Aab: LP 395-8 A, Karmn J20198+229

B: LP 395-8 B

C: Gaia DR2 1829571684884360832



	Aab-B	Aab-C	
WDS	KPP 4191	...	
ρ	1.92	11.02	arcsec
θ	355.5	307.4	deg
μ ratio	0.19	0.054	
ΔPA	10.6	0.0093	deg
$\Delta d/d$	0.000044	0.0012	
d	29.50		pc
s	56.6	325	au
P_{orb}	0.432	5.95	10^3 a
$-U_g^*$	9231	5954	10^{33} J

Component	Aab	B	C	
SpT	M3.0 V + m0 V ^a	m3.5 V	m9: V	
α	20:19:49.36	20:19:49.35	20:19:48.72	
δ	+22:56:38.1	+22:56:40.0	+22:56:44.8	
π	33.897 ± 0.026	33.896 ± 0.053	33.94 ± 0.34	mas
$\mu_\alpha \cos \delta$	83.565 ± 0.019	63.613 ± 0.041	88.09 ± 0.25	mas a^{-1}
μ_δ	106.536 ± 0.019	122.155 ± 0.039	112.33 ± 0.26	mas a^{-1}
γ	km s^{-1}
G	11.0225 ± 0.0029	12.8748 ± 0.0028	19.4441 ± 0.0039	mag
J	8.166 ± 0.021	...	13.82 ± 0.11	mag
L	$10^{-4} L_\odot$
T_{eff}	K
\mathcal{M}	$0.348 + 0.621^a$	0.305	0.077	\mathcal{M}_\odot
RUWE	1.484	1.639	1.046	
Qflag 2MASS	AAA	...	BBA	
Qflag AllWISE	AAAA	

^a Baroch et al. 2018.

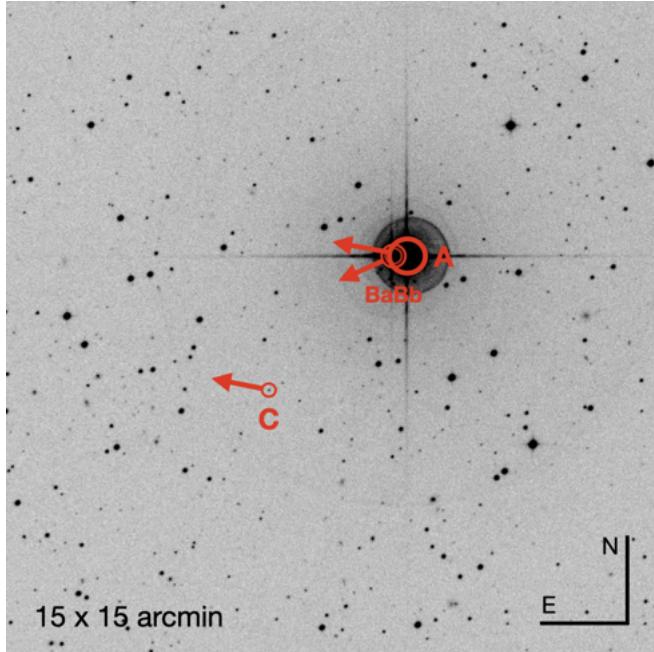
LP 395-8 AB is a known binary system of M dwarfs located at less than 30 pc, which small projected separation (1.9 arcsec) affects the quality of the astrometric data. The primary (LP 395-8 A) was identified to be a spectroscopic binary by Baroch et al. (2018). To this known triple system, we add a fourth candidate to physical companion and estimated to be a very late-M dwarf from its intrinsic brightness in G and J .

WDS 22259-7501 (TOK 434 + DUN 238 + KO 5)

A: HD 212168, Königstuhl 5A

BaBb: CPD-75 1748B, Königstuhl 5B

C: DENIS J222644.3-750342, Königstuhl 5C



	A-BaBb	A-C	
WDS	DUN 238	KO 5	
ρ	20.89	264.8	arcsec
θ	79.3	128.9	deg
μ ratio	0.49	0.029	
ΔPA	19.08	1.268	deg
$\Delta d/d$	0.0007	0.002	
d		23.41	pc
s	489.2	6199	au
P_{orb}	10.25	462.3	10^3 a
$-U_g^*$	2895	29.7	10^{33} J

Component	A	BaBb	C	
SpT	G0 V	k3 V+	M8	
α	22:25:51.39	22:25:56.69	22:26:44.66	
δ	-75:00:56.3	-75:00:52.4	-75:03:42.3	
π	42.722 ± 0.020	42.69 ± 0.25	42.637 ± 0.078	mas
$\mu_\alpha \cos \delta$	57.385 ± 0.021	33.33 ± 0.29	58.739 ± 0.084	mas a^{-1}
μ_δ	12.835 ± 0.023	-3.78 ± 0.30	11.779 ± 0.092	mas a^{-1}
γ	$+14.51 \pm 0.14$	$+17.86 \pm 0.59$	$+17 \pm 2^a$	km s^{-1}
G	5.9771 ± 0.0028	8.3805 ± 0.0028	16.7983 ± 0.0031	mag
J	5.262 ± 0.276	6.559 ± 0.029	12.353 ± 0.023	mag
L	15900 ± 290	...	7.06 ± 0.11	$10^{-4} L_\odot$
T_{eff}	5900 ± 50	...	2400 ± 50	K
M	1.11	0.720	0.0935	M_\odot
RUWE	1.017	16.764	1.189	
Qflag 2MASS	DEE	AAA	AAA	
Qflag AllWISE	BBAA	BAAA	AAAU	

^a Burgasser et al. 2015.

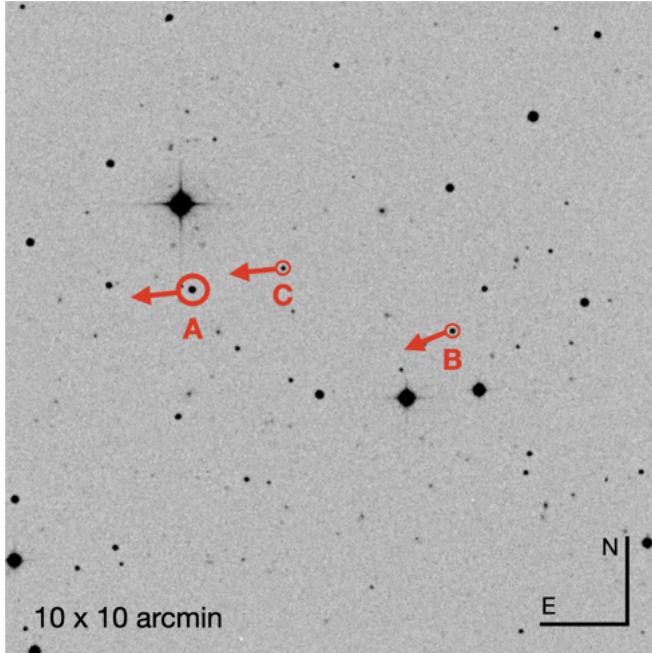
The G0 dwarf HD 212168 and the close binary CPD -75° 1748B (TOK 434), separated 21 arcsec, form a triple system, which is additionally orbited by the M8.5 V star DENIS J222644.3-750342, separated 265 arcsec. Caballero et al. (2012) confirmed the physical binding. The Sun-like primary and the low-mass companion share common parallax, proper motion and radial velocity. Gaia EDR3 astrometric data for the K-dwarf secondary is, however, affected by its close binarity ($\rho = 0.3$ arcsec).

WDS 23059+0614 (SLW 1299 + SLW 1300)

A: SLW J2305+0613 A

B: SLW J2305+0613 B

C: SLW J2305+0613 C



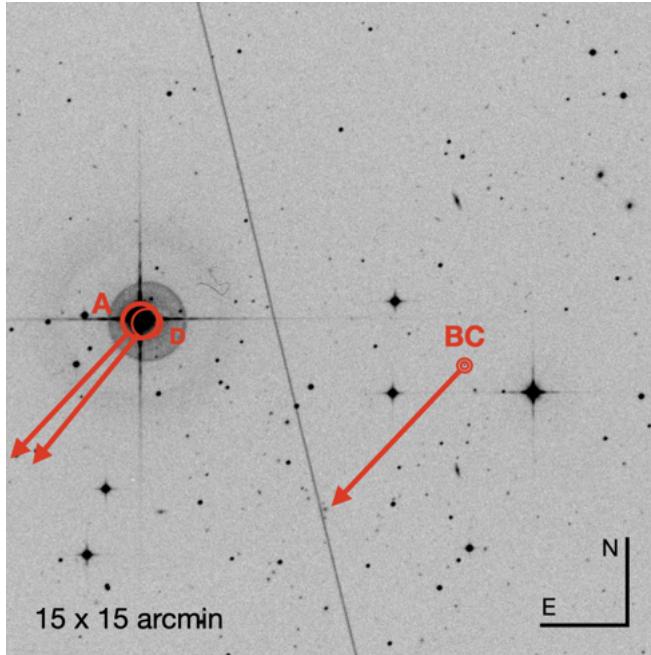
	A-B	A-C	
WDS	SLW 1299	SLW 1230	
ρ	242.4	86.00	arcsec
θ	260.9	283.1	deg
μ ratio	0.11	0.029	
ΔPA	6.14	1.47	deg
$\Delta d/d$	0.40	0.022	
d		216.9	pc
s	52578	186579	au
P_{orb}	16642	3518	10^3 a
$-U_g^*$	6.82	15.5	10^{33} J

Component	A	B	C	
SpT	M1.7	M3.2	M3.7	
α	23:05:51.69	23:05:35.65	23:05:46.08	
δ	+06:13:34.6	+06:12:56.1	+06:13:54.1	
π	4.609 ± 0.041	7.743 ± 0.084	4.71 ± 0.10	mas
$\mu_\alpha \cos \delta$	43.584 ± 0.044	42.158 ± 0.092	42.78 ± 0.12	mas a^{-1}
μ_δ	-5.291 ± 0.084	-9.784 ± 0.064	-6.308 ± 0.084	mas a^{-1}
γ	km s^{-1}
G	16.5216 ± 0.0062	18.146 ± 0.036	18.896 ± 0.029	mag
J	12.913 ± 0.025	13.826 ± 0.026	14.397 ± 0.034	mag
L	517 ± 22	196 ± 18	118 ± 11	$10^{-4} L_\odot$
T_{eff}	3500 ± 50	3300 ± 50	3200 ± 50	K
\mathcal{M}	0.525	0.386	0.312	\mathcal{M}_\odot
RUWE	1.081	1.086	0.937	
Qflag 2MASS	AAA	AAA	AAA	
Qflag AllWISE	AABU	AAUU	AAUU	

The pairs SLW J2305+0613 AB and BC are two known binary systems (SDSS SLoWPoKES Catalog; [Dhital et al. 2010](#)) of early-M dwarfs. We analyse the pairs A-B and A-C to test the candidacy for a triple system. We find that the parallactic distance of B differs by 40% to that of the primary, and also present a moderately large difference in proper motion. Given that the quality indicator RUWE does not indicate unreliable astrometry, we propose the B component to be a foreground star. Therefore, the pair A-B is visual, and the trio A-B-C does not qualify as a triple system.

WDS 23315-0405 (KO 3 + CLO 4 + GZA 1)

A: HD 221356, Königstuhl 3A
BC: 2MASSW J2331016-040618, Königstuhl 3BC
D: 2MASS J23313095-0405234



	A-BC	A-D	
WDS	KO 3	GZA 1	
ρ	451.7	12.46	arcsec
θ	261.7	221.6	deg
μ ratio	0.012	0.033	
ΔPA	0.080	1.75	deg
$\Delta d/d$	0.005	0.004	
d	25.832		pc
s	11670	322	au
P_{orb}	1205	5560	10^3 a
$-U_g^*$	26.6	468.4	10^{33} J

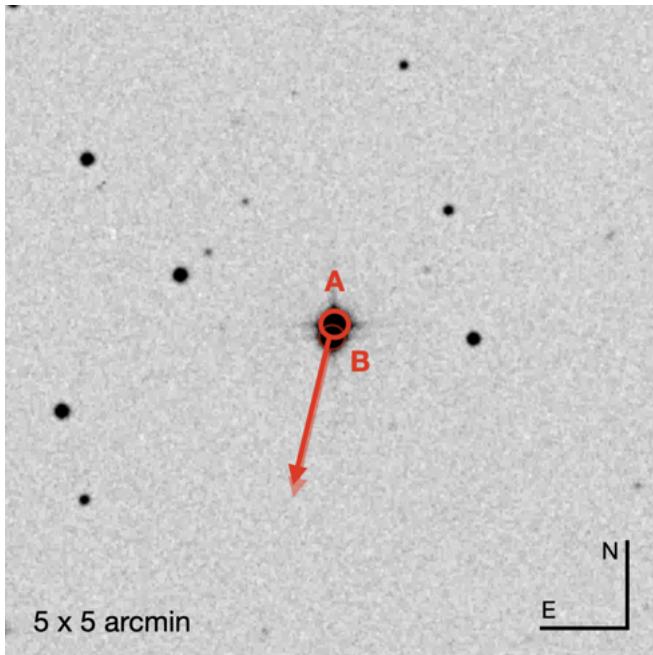
Component	A	BC	D	
SpT	F7 V	M8.0 V + L3.0 V	L1	
α	23:31:31.69	23:31:01.82	23:31:31.14	
δ	-04:05:17.7	-04:06:22.5	-04:05:27.0	
π	38.711 ± 0.024	38.51 ± 0.16	38.54 ± 0.36	mas
$\mu_\alpha \cos \delta$	178.130 ± 0.028	176.34 ± 0.17	169.94 ± 0.41	mas a^{-1}
μ_δ	-191.845 ± 0.017	-189.38 ± 0.13	-194.59 ± 0.30	mas a^{-1}
γ	-12.47 ± 0.18	km s^{-1}
G	6.3626 ± 0.0028	17.2032 ± 0.0037	18.527 ± 0.013	mag
J	5.488 ± 0.019	12.938 ± 0.024	12.198	mag
L	13740 ± 150	$10^{-4}L_\odot$
T_{eff}	6000 ± 50	K
\mathcal{M}	1.09	0.161	0.0792	\mathcal{M}_\odot
RUWE	0.857	1.2147	1.198	
Qflag 2MASS	AAA	AAA	UUB	
Qflag AllWISE	BAAA	AABU	...	

The triple system consisting of the F7 V HD 221356 and the 0.573' arcsec double (CLO 4; [Gizis et al. 2003](#)) 2MASSW J2331016-040618 (M8.0 V and L3.0 V), was confirmed to be a physically bound system by [Caballero \(2007\)](#). [Gauza et al. \(2012\)](#) reported a fourth component (L1 \pm 1) separated by 12.5 arcsec from the primary.

WDS 23536+1207 (VYS 11)

A: StKM 2-1787

B: TYC 1174-955-2, Karmn J23535+121



	A-B	
WDS	VYS 11	
ρ	5.78	arcsec
θ	165.1	deg
μ ratio	0.039	
ΔPA	2.190	deg
$\Delta d/d$	0.0018	
d	37.26	pc
s	215.5	au
P_{orb}	3.987	10^3 a
$-U_g^*$	2774	10^{33} J

Component	A	B	
SpT	K4 V	M2.5 V	
α	23:53:35.58	23:53:35.69	
δ	+12:06:20.4	+12:06:14.8	
π	26.839 ± 0.019	26.792 ± 0.035	mas
$\mu_\alpha \cos \delta$	40.265 ± 0.023	44.122 ± 0.039	mas a^{-1}
μ_δ	-113.773 ± 0.014	-110.989 ± 0.022	mas a^{-1}
γ	-21.69 ± 0.49	...	km s^{-1}
G	10.4261 ± 0.0028	11.2967 ± 0.0028	mag
J	8.403 ± 0.019	8.670 ± 0.029	mag
L	1103.5 ± 9.2	702.7 ± 8.8	$10^{-4} L_\odot$
T_{eff}	4000 ± 50	3500 ± 50	K
\mathcal{M}	0.629	0.538	\mathcal{M}_\odot
RUWE	1.183	1.520	
Qflag 2MASS	AAA	AAA	
Qflag AllWISE	AAAA	...	

Using the latest astrometric data from *Gaia* EDR3, we revisit the known binary system of StKM 2-1787 and TYC 1174-955-2, which comprises a mid-K dwarf and an early-M dwarf. We measure an orbital period of approximately 4000 years at a separation of 216 au. We confirm the binarity that Montes et al. (2018) left on hold, as new *Gaia* astrometry could come to settle the issue.