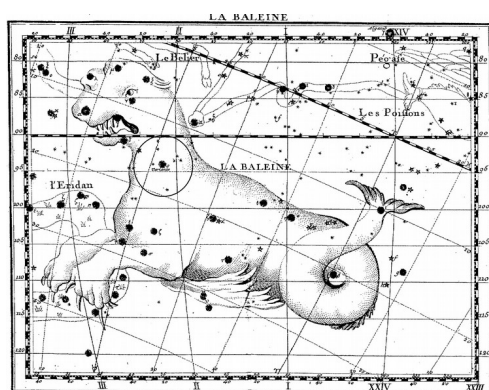
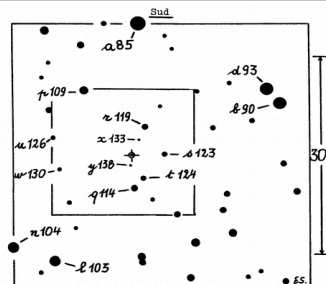


Bulletin de l'Association Française des Observateurs d'Etoiles Variables (AFOEV)



0749+22 U Geminorum (U Gem)

1900 : 07h 49m 10s +22° 15,9' précession annuelle
1950 : 07h 52m 08s +22° 08,3' +3,56s -0,153'
2000 : 07h 55m 06s +22° 00,6' éq. 1900
UOSS - mv 8,2 à 14,9 - per.moy. 105,2 j - sp. Pec(UG)+M4,5V

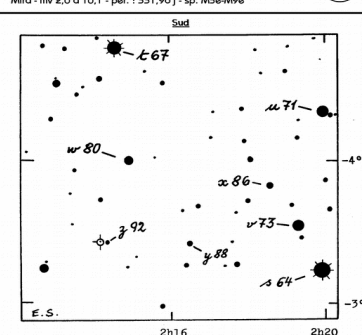


Carte et séquence AFOEV 1936
1991-IX

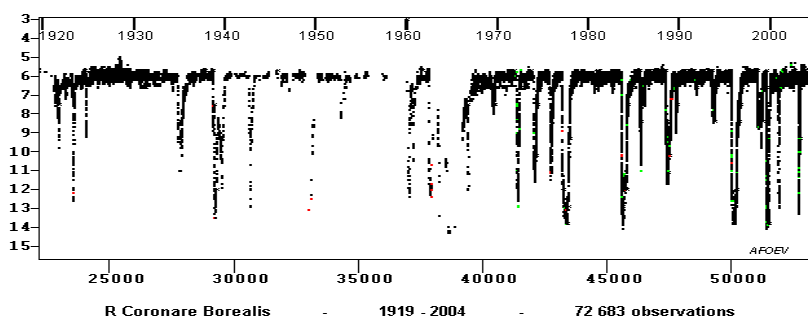


0214-03 Mira Ceti (oml Cet)

1900 : 02h 14m 18s -03° 26,1' précession annuelle
1950 : 02h 16m 49s -03° 12,2' +3,03s +0,278'
2000 : 02h 19m 21s -02° 58,3' éq. 1900



Carte et séquence AFOEV (1936)
1991-IV ; Éq 1900



R Coronae Borealis

1919 - 2004

72 683 observations

Bulletin
numéro 176
(2021-2)

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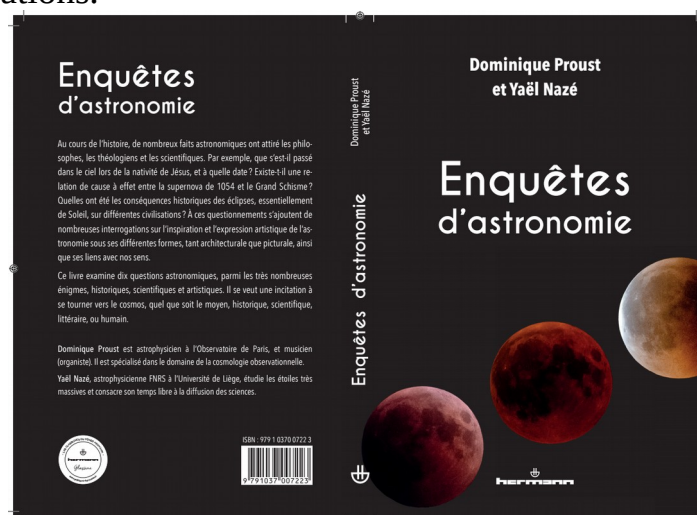
Le mot du Président

Dominique Proust (*Observatoire de Paris-campus de Meudon*)

La situation sanitaire n'a pas permis de fêter cette année le centenaire de l'AFOEV ; néanmoins cet évènement est rappelé dans l'agenda astronomique de l'Observatoire de Paris, et a fait l'objet d'une conférence que j'ai donnée lors des récentes journées de l'*Association Française d'Astronomie et d'Astrophysique (SF2A)*. L'idée d'une journée de l'AFOEV en 2022 à l'Observatoire de Strasbourg est toujours d'actualité, mais ne peut s'organiser qu'avec le concours de volontaires.

Nous commençons à retrouver un rythme de vie plus proche de la normale, même s'il faut attendre l'horripilante soirée à TU+2 qui nous fut imposée il y a plus de 40 ans par un quarteron de crétins. Néanmoins, l'arrivée des beaux jours (avec les risques de canicules liés à d'autres formes de crétinisme devrait nous permettre d'observer avec moins de stress. A propos de crétins, le fameux *crétin des Alpes* dénoncé par le capitaine Haddock existe bien : il s'agit d'un déficit en iode agissant sur la thyroïde.

Enfin, je me permets une page de publicité pour vous proposer une lecture cet été. Bonnes observations.



ESSAIS DE MESURES CCD SUR LES ETOILES VARIABLES CATAclysmIQUES

Jean-Jacques Castellani

C'est à la lecture d'un article de Jean Bourgeois, paru dans « Astrosurf Magazine » N°101, que m'est venu l'envie de remplacer mes estimations visuelles par des mesures CCD. Le but était également de simplifier au maximum la procédure de traitement et d'obtenir une précision de l'ordre de 0,1 magnitude comme en visuel. Je me suis tourné vers l'observation des étoiles cataclysmiques. En effet, les bases de données comportent des manques et certaines étoiles ne sont pas ou peu observées.

J'ai utilisé mon télescope de 400mm Newton sur monture équatoriale à fourche ainsi qu'une caméra Orion ProV2 en bining 2X2 me donnant des images en noir et blanc. Avec la focale de 1660mm l'échantillonnage est de 1,9"par pixel. Le capteur me donne un champ de 50'X32'. Les poses varient de 30 à 90s sans guidage. Les fichiers sont enregistrés en FITS. Ne disposant pas de Goto, le rythme de pointage et d'acquisition est le même qu'en visuel soit 10 à 12 enregistrements par heure d'observation. L'utilisation de la caméra me permet de gagner 2 magnitudes par rapport aux observations visuelles et d'observer des étoiles de magnitude 16 à 17.

Il me faut ensuite faire une mesure photométrique pour chaque image. J'utilise Muniwin et sa fonction "quick photometry" qui est une fonction de photométrie d'ouverture. Je mesure l'étoile variable ainsi que 4 ou 5 étoiles étalons données par les cartes AAVSO (voir fig.1, image de CH Uma). Je fais ensuite une moyenne des écarts entre les magnitudes données par Muniwin et les étoiles étalons de la carte. J'applique ensuite cette correction à l'étoile variable pour obtenir sa magnitude.

Je n'ai pas trouvé de tutoriel en français expliquant clairement la fonction des cercles; le premier (le vert) mesure le flux de l'étoile (j'essaie de l'ajuster au mieux au diamètre de l'étoile), l'espace entre les deux autres mesure le fond de ciel (on peut faire varier les dimensions de ces cercles). Il est important de tenir compte du facteur d'erreur mentionné en bas, s'il dépasse 0,1 : j'indique ma variable comme non vue. Le rapport S/N conditionne également la précision de la mesure.

On peut voir sur la courbe de v1391 Cas (fig.2) que mes mesures concordent bien avec les résultats obtenus en CV (sans filtre) par les autres observateurs.

Néanmoins, il ne faut pas négliger le supplément de travail que demande ce genre d'observations par rapport aux estimations visuelles. Le temps passé à faire la mesure photométrique est au moins aussi long que l'enregistrement des images. J'ai fait quelques essais de prétraitements (dark, offset et plu) mais je n'ai pas obtenu d'écarts significatifs supérieurs à (+/-0,1 mag).

N'hésitez pas à me faire part de vos commentaires en passant par la liste de diffusion. Bonnes observations à tous.

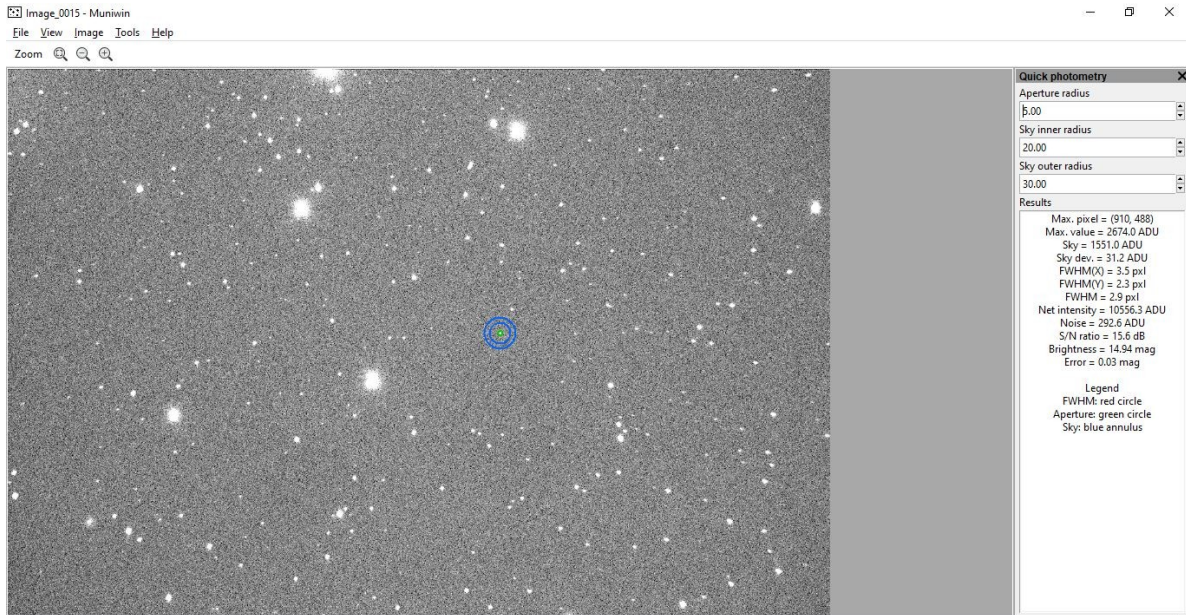


Figure 1

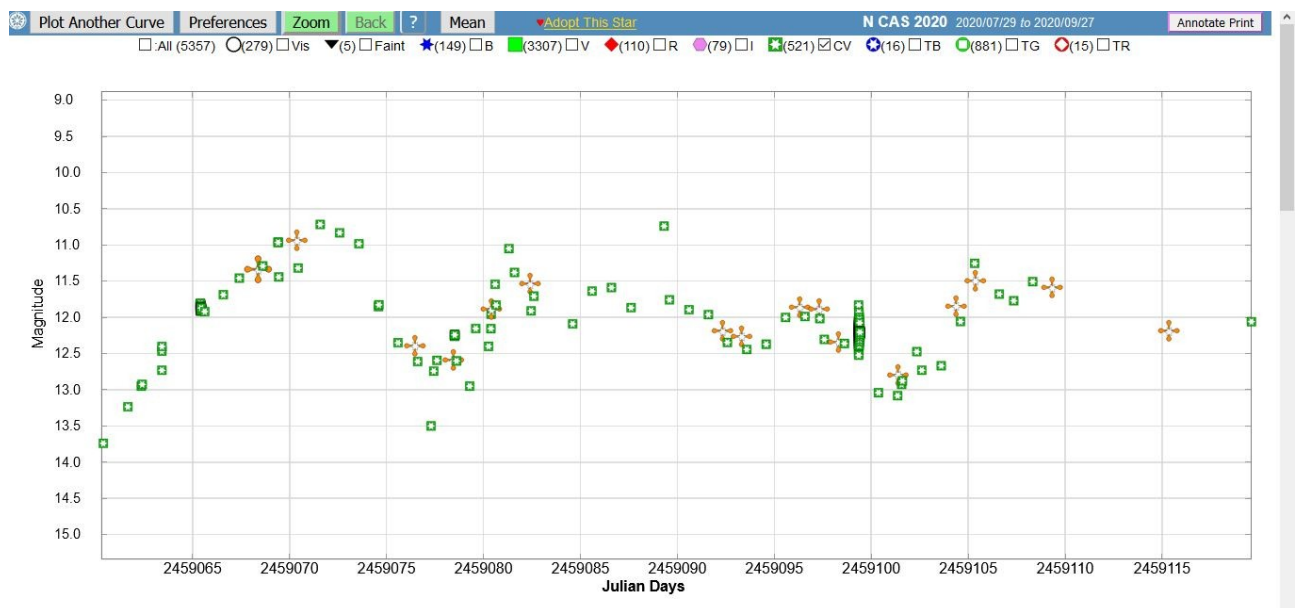


Figure 2

Liste des observateurs pour le 4ème trimestre 2020

Ce tableau rappelle la totalité des observations reçues au titre du quatrième trimestre 2020, ce qui ne veut pas dire que toutes ces observations ont été effectuées au cours de cette période. Il est fréquent que des retardataires envoient des observations bien antérieures qu'il est évidemment impossible d'inclure dans les listes déjà parues. Le classement est par ordre alphabétique des sigles.

Ne sont publiées dans le bulletin que les observations des adhérents de l'AFOEV relatives aux étoiles du programme de l'AFOEV.

Mis à part un nombre relativement restreint d'observations éliminées (observations « inférieures à » redondantes et observations manifestement erronées), les observations reçues sont intégrées à la base de données du CDS où l'ordre chronologique est évidemment respecté.

ACB CAPETILLO BLANCO Alicia	113	S KLT KARHULA Timo	6
S ANH DE ANGELIS Hernan	105	S KTS KARLSSON Thomas	708
BDJ BREARD Jean Marc	45	J KWE KOSHIKAWA Tetsuya	83
S BEN BENGTTSSON Hans	1	* LMT LEGUTKO Marian	45
BFM BOEUF Michel	164	S LNM LARSSON Magnus	368
B BMM BIESMANS Marc	267	B MUY MUYLLAERT Eddy	1716
N BMU BOUMA Reinder J.	5	NDQ NAILLON Dominique	141
N BVE VAN BALLEGOY Erwin	7	* NSJ NICOLAS Joel	11
CAS CASTELLANI Jean-Jacques	394	PDJ PERRARD Jean-Luc	13
E DAM DARRIBA-MARTINEZ Adolfo	184	PGT PEGUET Claude	711
N DKE VAN DIJK Edwin	21	K POY POYNER Garry	2390
T DPV DUBOVSKY Pavol A.	125	PRO PROUST Dominique	6
DUM DUMONT Michel	216	D RCR RAETZ Kerstin (Mme)	204
S DZG DUSZANOWICZ Gregor	82	E RIP RIPERO-OSORIO Jose	728
N GGU GILEIN Guus	180	N SRO SCHIPPERS Robert	17
# HGG HOLMBERG Gustav	439	Z STU STUBBINGS Rod	461
N HOO HOOGVEEN G	83	SUM SERRAU Marc	492
JPS SCIOLLA Jean-Pierre	145	VTL VADROT Laurent	2
JTP JACQUET Pierre	117	S WAR WARELL Johan	9
# KAR KARLSSON Bjorn	42	N WUB WUBBENA E.K.	89
KCH KUCHTO Serge	812		

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0000+55 FICAS	CAS 59171.34 Q<17.0	CAS 59200.316 Q 16.7	CAS 59166.382 Q 11.4	PGT 59174.6263 <12.7	PGT 59202.7 9.3
=====	CAS 59172.337 Q<16.3	=====	PGT 59174.6 11.6	CAS 59175.396 Q<17.1	=====
CAS 59139.389 Q 16.0	CAS 59175.349 Q<17.0	0106+21 XPSC	PGT 59179.6 11.5	PGT 59179.5902 <12.7	0217+70 AMCAS
CAS 59140.39 Q 16.6	=====	=====	PGT 59202.6 11.8	NDQ 59182.2791 <12.5	=====
CAS 59164.314 Q 16.5	0039+40 EGAND	JPS 59159.29 11.6	=====	CAS 59199.346 Q<17.1	CAS 59162.458 Q 14.4
CAS 59166.303 Q 15.8	=====	JPS 59166.35 11.1	0130+50 KTPER	CAS 59200.351 Q<16.3	CAS 59166.42 Q 15.0
CAS 59167.285 Q 15.45	JTP 59134.5 : 7.6	JPS 59175.28 10.2	=====	PGT 59202.6569 <12.7	CAS 59170.428 Q 13.15
CAS 59170.332 Q 16.0	JTP 59141.4 : 7.3	=====	CAS 59164.409 Q 15.1	=====	CAS 59171.411 Q 13.25
CAS 59171.317 Q 16.0	=====	0106+34 FNAND	CAS 59166.378 Q 15.0	0204+48 RVAND	PDJ 59172.2951 Y 13.24
CAS 59172.313 Q 16.25	0043+56 GXCAS	=====	CAS 59171.383 Q 12.9	=====	CAS 59172.416 Q 13.4
CAS 59174.307 Q<17.1	=====	CAS 59140.437 Q<15.9	CAS 59172.383 Q 13.2	NDQ 59202.3 10.3	PDJ 59174.2826 Y 13.7
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=====	CAS 59164.347 Q<16.5	CAS 59164.383 Q<16.7	CAS 59200.335 Q 14.5	0205+56 UWPER	CAS 59175.413 Q 14.45
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CAS 59166.308 Q 13.85	0045+33 RRAND	CAS 59140.442 Q 16.0	0139+37 ARAND	CAS 59199.35 Q<16.6	CAS 59162.451 Q<16.1
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0025+41 LSAND	0101-02 ZCET	CAS 59164.403 Q<16.6	0203+56 KKPER	=====	=====
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=====	CAS 59162.388 Q 16.8	0127+46 SXAND	=====	PGT 59174.6 7.7	=====
0036+26 LLAND	CAS 59164.38 Q 16.7	=====	CAS 59162.432 Q<16.3	PGT 59179.6 7.8	CAS 59164.458 Q 16.15
=====	CAS 59166.354 Q<16.5	JPS 59142.35 9.3	CAS 59164.427 Q<16.3	PGT 59202.6 7.7	CAS 59166.438 Q 15.5
CAS 59140.416 Q<17.0	CAS 59170.38 Q<16.5	JPS 59159.25 9.2	CAS 59166.395 Q<17.1	=====	CAS 59170.45 Q 15.45
CAS 59164.342 Q<17.0	CAS 59171.359 Q<16.5	JPS 59172.25 9.2	CAS 59170.408 Q<16.3	0215+58 SPER	CAS 59172.445 Q 16.25
CAS 59166.328 Q<17.0	CAS 59172.36 Q 16.15	=====	CAS 59171.394 Q<16.3	=====	CAS 59174.446 Q 15.05
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0236+37 PVPER =====	0319+19 SVARI =====	0418-13 AHERI =====	JPS 59172.51 11.8 =====	0549+32 AYAU =====	0651+11 YMON =====
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0239+33 UWTRI =====	0320+43 YPER =====	0419+16 VXTAU =====	JPS 59166.42 8.0 =====	JPS 59171.53 10.5 =====	0652-08 XMON =====
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0241+36 TXPER =====	0323+35 RPER =====	0422+09 RTAU =====	JTP 59134.5 : 6.3 =====	0554+39 AZAUR =====	0655+10 BIMON =====
PGT 59174.6 9.9 CAS 59201.38 11.0 =====	PGT 59174.6 9.7 CAS 59201.42 8.5 =====	JPS 59170.7 8.7 JPS 59171.57 8.2 PGT 59181.7 7.7 PGT 59188.7 7.8 =====	PGT 59181.7 :13.1 =====	PGT 59188.7 10.3 PGT 59202.7 10.4 =====	JPS 59171.58 <13.7 =====
0242+17 TARI =====	0323+39 RUPER =====	0422+15 WTAU =====	0519+50 ACAUR =====	0556+46 RSAUR =====	0659+10 BCGEM =====
JPS 59140.37 9.5 JPS 59164.37 9.2 JPS 59171.32 8.9 =====	PGT 59174.6 11.4 =====	0423+09 STAU =====	PGT 59188.7 11.8 =====	PGT 59178.7 9.7 PGT 59181.7 9.8 PGT 59188.7 9.7 PGT 59202.7 9.8 =====	JPS 59172.53 <13.2 =====
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PGT 59174.6 9.5 PGT 59179.6 9.2 PGT 59202.7 9.3 =====	JTP 59134.5 5.7 JTP 59141.4 5.9 JTP 59144.3 5.6 JTP 59157.5 5.6 JTP 59171.4 6.0 JTP 59181.4 : 5.7 JTP 59199.4 : 5.9 =====	0440+25 RVTAU =====	JPS 59175.5 10.2 =====	0602+22 SSGEM =====	JPS 59175.55 <13.4 =====
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0302+26 ZARI =====	KCH 59134.335 3.45 KCH 59134.342 6.4 JTP 59134.5 6.3 JTP 59141.4 : 6.3 KCH 59157.335 6.4 KCH 59157.424 6.4 KCH 59158.331 6.4 KCH 59158.415 6.4 KCH 59159.333 6.4 KCH 59159.409 6.4 KCH 59179.379 6.4 KCH 59181.314 6.4 KCH 59182.338 6.45 =====	JPS 59172.32 7.5 =====	0533+37 RUAUR =====	PGT 59181.7 12.3 PGT 59188.7 :13.1 =====	JTP 59199.4 : 6.5 =====
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0305+14 UARI =====	JPS 59166.38 11.0 JPS 59175.31 10.5 =====	CAS 59147.577 Q<16.4 CAS 59174.494 Q<16.9 CAS 59200.43 Q<16.9 =====	0535+38 SZAUR =====	PGT 59170.7361 <12.5 PGT 59178.7437 <12.5 PGT 59181.7236 :13.0 PGT 59188.7194 <13.0 PGT 59202.6715 <13.2 =====	JPS 59171.54 9.5 =====
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0313+60 FTCAM =====	0401+50 FOPER =====	JPS 59171.51 13.5 =====	0539+09 FUORI =====	0611+15 CZORI =====	JPS 59172.32 10.2 =====
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0316+41 V336PER =====	0411+50 NSPER =====	0500+03 VORI =====	JTP 59134.5 : 1.1 JTP 59146.4 1.3 JTP 59153.4 1.2 JTP 59157.5 : 1.0 JTP 59158.6 1.2 JTP 59171.4 : 1.3 JTP 59181.4 0.7 JTP 59188.4 : 0.9 JTP 59199.4 1.3 NDQ 59202.3 1.2 JTP 59202.4 1.5 JTP 59209.4 0.8 JTP 59215.2 1.2 =====	0618+24 CDGEM =====	JPS 59175.58 10.5 =====
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				JPS 59172.5 <13.4 =====	JPS 59175.56 9.4 =====
					1037+69 RUMA =====
					PRO 59146.42 7.0 PRO 59160.4 8.2 NDQ 59169.3 8.1

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1038+67 VYUMA	=====	1425+84 RCAM	DUM 59042.44 6.1	NDQ 59166.2562 9.5	=====
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KCH 59066.427 6.45	=====	PRO 59160.4 12.2	DUM 59052.39 6.1	PGT 59172.2354 9.5	=====
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KCH 59068.385 6.55	PGT 59141.3 8.0	1508+50 FGBOO	DUM 59059.4 6.1	PGT 59179.2145 9.6	=====
KCH 59069.389 6.55	PGT 59153.2 8.4	=====	DUM 59060.4 6.15	=====	KCH 59066.43 6.36
KCH 59082.342 6.65	PGT 59160.2 8.5	DUM 59041.44 8.1	DUM 59066.38 6.1	1559+47 XHER	KCH 59066.438 6.53
KCH 59084.342 6.45	PGT 59166.2 8.5	DUM 59049.42 7.8	KCH 59066.429 6.46	=====	KCH 59067.39 6.51
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KCH 59096.356 6.55	NDQ 59180.3 9.2	DUM 59068.37 7.7	DUM 59069.34 6.5	PGT 59163.2 6.2	KCH 59082.343 6.49
KCH 59097.332 6.58	PGT 59181.2 9.5	DUM 59069.37 7.7	DUM 59070.34 6.3	PGT 59166.3 6.2	KCH 59082.393 6.71
KCH 59098.335 6.55	=====	DUM 59070.39 7.75	DUM 59073.37 6.1	PGT 59172.3 6.3	KCH 59084.346 6.51
KCH 59099.329 6.54	1240+45 YCVN	DUM 59076.4 7.73	DUM 59076.37 6.1	PGT 59179.2 6.2	KCH 59092.359 6.25
KCH 59100.336 6.6	=====	DUM 59080.38 7.69	DUM 59077.33 6.2	=====	KCH 59093.344 6.36
KCH 59101.33 6.61	DUM 59076.38 5.9	DUM 59082.36 7.7	DUM 59080.37 6.15	1601+67 AGDRA	KCH 59094.349 6.49
KCH 59103.343 6.45	DUM 59077.33 5.4	DUM 59105.39 7.67	DUM 59082.36 6.1	=====	KCH 59094.356 6.36
KCH 59104.338 6.45	DUM 59082.45 5.9	DUM 59107.38 7.75	DUM 59083.4 6.1	PGT 59135.3 10.1	KCH 59095.338 6.31
KCH 59105.322 6.5	=====	DUM 59110.39 7.75	DUM 59088.42 6.05	PGT 59141.3 10.2	KCH 59095.347 6.36
KCH 59108.324 6.45	1252+66 RYDRA	DUM 59114.33 7.71	DUM 59096.4 6.1	PGT 59153.3 10.2	KCH 59096.356 6.28
KCH 59110.328 6.45	=====	=====	DUM 59098.39 6.1	PGT 59162.4 10.1	KCH 59096.376 6.43
KCH 59114.333 6.45	PGT 59135.3 6.4	1510+83 ZUMI	DUM 59099.4 6.2	PGT 59167.4 10.0	KCH 59096.379 6.36
KCH 59134.292 6.45	PGT 59141.3 6.4	=====	DUM 59105.38 6.05	PGT 59172.3 10.1	KCH 59097.327 6.45
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KCH 59159.252 6.45	PGT 59160.2 6.3	NDQ 59199.3 11.0	DUM 59107.33 6.0	=====	KCH 59097.358 6.51
=====	PGT 59166.2 6.3	=====	DUM 59114.33 6.1	1611+38 WCRB	KCH 59098.338 6.49
1122+45 STUMA	PGT 59172.3 6.3	1516+14 SFER	PGT 59135.3 6.4	=====	KCH 59099.33 6.51
=====	PGT 59181.2 6.3	=====	PGT 59141.3 6.5	PGT 59163.2 <12.7	KCH 59099.347 6.51
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=====	1322+62 RRUMA	=====	JTP 59144.3 6.3	1621+19 UHER	KCH 59100.34 6.67
1151+58 ZUMA	=====	1517+31 SCRB	PGT 59153.3 6.4	=====	KCH 59101.333 6.58
=====	PGT 59135.3 9.4	=====	PGT 59154.2 6.5	DUM 59114.36 9.0	KCH 59101.34 6.53
JTP 59134.5 : 6.9	PGT 59141.3 9.8	DUM 59037.43 8.3	PGT 59160.2 6.4	JPS 59142.27 7.2	KCH 59101.358 6.57
PGT 59135.3 6.9	PGT 59153.2 9.7	DUM 59040.41 8.3	PGT 59163.2 6.4	=====	KCH 59103.342 6.36
PGT 59141.3 6.9	PGT 59172.3 10.6	DUM 59041.45 8.33	PGT 59166.2 6.3	1625+42 GHER	KCH 59104.338 6.67
PGT 59153.2 7.0	PGT 59181.2 10.5	DUM 59049.4 8.21	PGT 59168.2 6.2	=====	KCH 59104.358 6.49
PGT 59160.2 7.2	=====	DUM 59051.4 8.27	PGT 59172.2 6.2	PGT 59135.3 5.3	KCH 59105.323 6.49
PGT 59166.2 7.0	1332+73 TUMI	DUM 59055.48 8.04	PGT 59176.2 6.2	PGT 59141.3 5.3	KCH 59105.365 6.52
JTP 59171.4 : 8.0	=====	DUM 59057.42 7.79	PGT 59179.2 6.1	PGT 59153.3 5.2	KCH 59106.388 6.59
PGT 59172.2 7.5	PGT 59135.3 11.5	DUM 59059.41 7.74	=====	PGT 59163.2 5.2	KCH 59108.325 6.57
PGT 59181.2 7.8	PGT 59141.3 11.6	DUM 59066.38 7.66	1546+15 RSER	PGT 59166.3 5.2	KCH 59108.381 6.53
JTP 59199.4 : 8.2	PGT 59153.3 11.3	DUM 59068.36 7.72	=====	PGT 59172.3 5.2	KCH 59109.323 6.49
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1200+12 SUVIR	PGT 59172.3 10.5	DUM 59070.38 7.72	DUM 59037.41 7.9	=====	KCH 59110.353 6.62
=====	PGT 59177.3 10.1	DUM 59073.37 7.7	DUM 59040.41 8.0	1631+37 WHER	KCH 59113.379 6.49
JPS 59176.67 8.9	NDQ 59180.3 10.9	DUM 59076.36 7.72	DUM 59044.43 8.1	=====	KCH 59114.306 6.49
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1215+61 RYUMA	PGT 59202.3 10.8	DUM 59079.37 8.17	DUM 59052.43 8.2	PGT 59141.3 12.0	KCH 59114.382 6.62
=====	=====	DUM 59080.36 8.29	DUM 59068.36 8.8	PGT 59163.2 :13.0	KCH 59115.362 6.62
PGT 59135.3 6.9	1336+74 VUMI	DUM 59082.35 8.33	DUM 59069.38 8.8	=====	KCH 59134.339 6.49
PGT 59141.3 7.0	=====	DUM 59083.42 8.34	DUM 59077.36 8.8	1631+72 RUMI	KCH 59157.333 7.43
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PGT 59160.2 7.2	PGT 59141.3 7.7	PGT 59135.3 9.1	=====	PGT 59135.3 10.1	KCH 59159.251 7.43
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PGT 59172.2 7.1	PGT 59162.4 7.8	PGT 59153.3 9.8	=====	PGT 59153.3 9.8	KCH 59160.248 6.36
PGT 59177.3 7.1	PGT 59167.4 7.8	PGT 59163.2 10.0	PGT 59135.3 7.9	PGT 59162.4 10.1	KCH 59166.269 6.36
PGT 59181.2 7.2	PGT 59172.3 7.9	PGT 59166.2 10.0	PGT 59141.3 7.8	PGT 59167.4 10.0	KCH 59182.258 7.43
=====	PGT 59177.3 7.9	PGT 59172.2 10.1	PGT 59153.3 7.9	PGT 59172.3 9.9	=====
1225+32 TCVN	NDQ 59182.3 8.2	=====	PGT 59163.2 8.0	PGT 59177.3 10.1	1656+31 RVHER
=====	NDQ 59199.3 8.2	1531+15 TAU4SER	PGT 59166.2 8.2	NDQ 59180.3 9.8	=====
JPS 59176.67 9.6	PGT 59202.3 7.9	=====	PGT 59172.2 8.1	NDQ 59199.3 9.2	JPS 59142.3 11.2
=====	=====	JTP 59144.3 6.6	PGT 59176.2 8.1	PGT 59202.3 10.3	=====
1231+60 TUMA	1411+34 DRBOO	=====	=====	=====	1657+22 SYHER
=====	=====	1533+78 SUMI	1554-22 DELTASCO	1632+66 RDRA	=====
PGT 59141.3 9.6	DUM 59041.44 8.42	=====	=====	=====	PGT 59128.4 9.1
PGT 59153.2 8.7	DUM 59057.45 8.74	PGT 59135.3 8.7	DUM 59066.38 1.83	PGT 59135.3 8.2	PGT 59135.4 8.6
PGT 59160.2 8.2	DUM 59068.38 8.7	PGT 59141.3 8.7	DUM 59067.38 1.83	PGT 59141.3 8.4	PGT 59141.3 9.1
PGT 59166.2 7.2	DUM 59069.37 8.7	PGT 59153.3 8.7	DUM 59068.35 1.81	PGT 59153.3 9.0	PGT 59154.3 9.9
NDQ 59169.3 7.4	DUM 59070.39 8.7	PGT 59162.4 8.7	DUM 59069.36 1.76	PGT 59162.4 9.2	PGT 59163.2 11.0
PGT 59172.2 6.9	DUM 59076.45 8.5	PGT 59167.4 8.6	DUM 59070.34 1.73	PGT 59167.4 9.8	PGT 59166.3 11.7
PGT 59177.3 6.8	DUM 59080.38 8.4	PGT 59172.3 8.7	DUM 59073.36 1.77	PGT 59172.3 9.6	PGT 59172.3 12.0
NDQ 59180.3 6.8	DUM 59082.36 8.4	PGT 59177.3 8.5	DUM 59076.36 1.77	PGT 59177.3 10.0	=====
PGT 59181.2 6.8	=====	NDQ 59180.3 8.7	DUM 59077.34 1.72	PGT 59202.3 <11.8	1659-12 UXOPH
=====	1415+67 UUMI	NDQ 59199.3 8.9	DUM 59080.35 1.74	=====	=====
1233+66 RVDRA	=====	PGT 59202.3 8.7	DUM 59082.36 1.77	1633+60 TXDRA	JPS 59140.28 11.0
=====	PGT 59135.3 11.0	=====	DUM 59083.36 1.79	=====	=====
PGT 59135.3 11.7	PGT 59141.3 11.0	1537+38 RRCRB	=====	PGT 59163.3 7.7	1702+17 VYHER
PGT 59141.3 11.4	PGT 59153.3 11.1	=====	1555+26 TCRB	=====	=====
PGT 59153.2 10.1	PGT 59162.4 11.0	PGT 59135.3 7.9	=====	1640+12 UVHER	PGT 59141.3 12.4
PGT 59160.2 9.8	PGT 59167.4 11.5	PGT 59141.3 7.6	NDQ 59134.2631 9.7	=====	=====
PGT 59166.2 9.7	PGT 59172.3 11.1	PGT 59153.3 7.6	PGT 59135.2576 9.7	JPS 59142.29 9.7	1707+40 V939HER
PGT 59172.3 9.6	PGT 59177.3 11.2	PGT 59163.2 7.7	PGT 59141.2555 9.8	=====	=====
PGT 59181.2 9.7	NDQ 59180.3 <11.1	PGT 59166.2 7.4	PGT 59142.252 9.7	1640+55 SDRA	DUM 59040.46 8.61
=====	NDQ 59199.3 11.6	PGT 59172.2 7.6	NDQ 59144.2659 9.7	=====	DUM 59049.43 8.4
1234+59 RSUMA	PGT 59202.3 11.5	PGT 59176.2 7.6	NDQ 59145.2659 9.5	PGT 59163.3 8.9	DUM 59052.41 7.96
=====	=====	=====	PGT 59153.2555 9.5	=====	DUM 59055.47 8.2
PGT 59141.3 <12.6	1419+54 SBOO	1544+28 RCRB	PGT 59154.2347 9.5	1647+05 RXOPH	DUM 59057.48 8.4
PGT 59153.2 <12.6	=====	=====	NDQ 59159.2472 9.7	=====	DUM 59059.48 8.7
PGT 59166.2 <12.6	PGT 59135.3 :12.4	DUM 59032.42 6.1	PGT 59160.2506 9.5	JPS 59140.3 9.2	DUM 59067.44 8.0

DUM 59070.4 8.6	1805+31 THER	PGT 59141.4 11.2	KCH 59158.413 6.36	=====	=====
DUM 59073.39 8.4	=====	PGT 59153.3 12.0	KCH 59159.247 6.31	BDJ 59137.4306 N 11.82	JPS 59142.32 12.0
DUM 59076.4 8.0	PGT 59128.4 8.1	NDQ 59159.3 11.9	KCH 59159.333 6.28	PGT 59141.4 12.4	=====
DUM 59080.4 7.95	PGT 59135.4 8.3	PGT 59162.3 11.9	KCH 59159.41 6.3	NDQ 59145.3 12.2	1906+43 STLYR
DUM 59082.39 8.0	PGT 59141.3 8.4	PGT 59168.3 12.0	KCH 59160.246 6.31	PGT 59153.3 12.8	=====
DUM 59083.44 8.1	PGT 59163.3 9.2	PGT 59174.3 11.9	KCH 59166.265 6.28	=====	NDQ 59159.3 11.3
DUM 59105.45 8.4	PGT 59168.2 9.4	PGT 59179.3 11.8	KCH 59166.269 6.27	1843+00 V603AQL	=====
DUM 59107.45 8.0	PGT 59179.2 11.0	BDJ 59181.339 N 11.41	KCH 59169.315 6.34	=====	1909+25 SLYR
DUM 59110.39 7.92	=====	PGT 59202.3 11.8	KCH 59179.258 6.28	PGT 59135.3715 11.5	=====
DUM 59114.35 7.94	1805+65 WDRA	=====	KCH 59180.264 6.28	PGT 59141.352 11.5	BDJ 59137.3965 N 12.09
=====	=====	1832+27 CELYR	KCH 59181.233 6.27	PGT 59153.2888 11.8	NDQ 59144.3 13.1
1714+01 ZOPH	PGT 59163.3 11.6	=====	KCH 59181.31 6.27	PGT 59166.2548 11.8	BDJ 59181.313 N 12.7
=====	=====	BDJ 59137.3807 N 13.3	KCH 59182.251 6.27	=====	=====
PGT 59174.2 10.1	1811+03 RYOPH	=====	KCH 59182.336 6.31	1844-08 SSCT	1909+33 RSLYR
=====	=====	1833+08 XOPH	=====	=====	=====
1714+02 V2113OPH	PGT 59174.3 9.2	=====	1839+22 AEHER	PGT 59135.4 7.3	PGT 59141.4 <13.4
=====	=====	PGT 59174.3 6.5	=====	PGT 59153.3 7.4	NDQ 59145.3 <13.4
DUM 59032.41 6.98	1811+36 WLVR	=====	PGT 59141.3 10.5	PGT 59174.2 7.2	=====
DUM 59037.42 7.0	=====	1834+39 XLYR	=====	=====	1909+41 RULYR
DUM 59038.42 6.8	BDJ 59137.3835 N 11.95	=====	1841+34 RVLVR	1850+32 RXLYR	=====
DUM 59040.42 6.9	NDQ 59144.3 11.6	KCH 59061.41 6.33	=====	=====	BDJ 59137.437 N 11.13
DUM 59041.41 6.7	PGT 59174.3 9.8	KCH 59066.428 6.31	BDJ 59137.4005 N 13.88	NDQ 59145.3 <13.0	PGT 59141.4 11.1
DUM 59042.42 6.7	PGT 59179.2 9.3	KCH 59066.433 6.27	NDQ 59145.3 <13.2	=====	JPS 59142.33 11.0
DUM 59044.42 6.7	BDJ 59181.301 N 9.69	KCH 59066.439 6.28	=====	1850+36 SULYR	NDQ 59145.3 11.5
DUM 59049.4 7.06	PGT 59194.3 8.6	KCH 59067.387 6.29	1842-05 RSCT	=====	PGT 59153.3 10.5
DUM 59050.42 6.99	PGT 59202.2 8.5	KCH 59067.392 6.29	=====	NDQ 59159.3 <13.3	PGT 59162.3 10.6
DUM 59052.39 7.03	=====	KCH 59068.381 6.28	DUM 59032.42 5.69	=====	PGT 59168.3 10.6
DUM 59053.45 6.98	1814+31 AOLYR	KCH 59068.392 6.27	DUM 59037.45 5.68	1851+31 SXLYR	PGT 59174.3 10.6
DUM 59055.42 7.0	=====	KCH 59069.381 6.27	DUM 59040.45 5.68	=====	PGT 59179.3 10.6
DUM 59057.41 6.56	NDQ 59159.3 <13.7	KCH 59069.39 6.29	DUM 59042.43 5.61	NDQ 59159.3 12.2	PGT 59202.3 11.3
DUM 59059.39 6.53	=====	KCH 59082.347 6.32	DUM 59049.45 5.73	=====	=====
DUM 59060.38 6.7	1816+31 TULYR	KCH 59082.356 6.3	DUM 59052.42 5.7	1851+32 FFLYR	1910+46 SSLYR
DUM 59066.39 6.7	=====	KCH 59082.39 6.31	DUM 59053.48 5.73	=====	=====
DUM 59067.4 6.99	PGT 59128.4 9.9	KCH 59084.34 6.3	DUM 59055.47 5.76	BDJ 59137.4055 N 13.34	BDJ 59137.4414 N 9.47
DUM 59068.37 6.7	PGT 59135.4 10.0	KCH 59089.38 6.33	DUM 59057.44 5.73	=====	PGT 59141.4 9.8
DUM 59069.38 6.42	BDJ 59137.3775 N 9.9	KCH 59092.355 6.31	DUM 59059.43 5.72	1856+34 ZLYR	PGT 59153.3 9.9
DUM 59070.35 6.7	PGT 59141.4 10.1	KCH 59092.361 6.3	DUM 59060.41 5.71	=====	NDQ 59159.3 10.6
DUM 59073.37 6.98	PGT 59153.3 10.1	KCH 59093.342 6.34	DUM 59066.4 5.69	BDJ 59137.4118 N 11.05	PGT 59162.3 10.3
DUM 59076.36 7.0	NDQ 59159.3 10.2	KCH 59094.348 6.27	KCH 59066.428 5.16	NDQ 59145.3 11.8	PGT 59202.3 11.3
DUM 59077.34 7.03	PGT 59162.3 10.4	KCH 59094.353 6.27	KCH 59067.39 5.17	PGT 59153.3 12.3	=====
DUM 59080.37 6.82	PGT 59168.2 10.5	KCH 59095.339 6.3	KCH 59068.391 5.13	PGT 59162.3 12.4	1913+49 TZCYG
DUM 59082.37 6.7	PGT 59174.3 10.6	KCH 59095.344 6.31	DUM 59068.4 5.71	BDJ 59181.32 N 12.95	=====
DUM 59083.37 6.7	PGT 59179.3 10.6	KCH 59096.356 6.27	KCH 59069.386 5.16	=====	PGT 59130.6 10.9
DUM 59088.43 6.93	BDJ 59181.297 N 10.33	KCH 59096.374 6.27	DUM 59069.44 5.63	1857+37 RTLYR	PGT 59153.4 10.7
DUM 59096.4 6.7	PGT 59202.3 11.1	KCH 59096.378 6.27	DUM 59076.4 5.62	=====	PGT 59162.4 10.8
DUM 59097.34 6.7	=====	KCH 59097.322 6.31	DUM 59077.39 5.64	BDJ 59137.4179 N 13.62	PGT 59167.4 11.0
DUM 59098.41 6.55	1817+30 TVLYR	KCH 59097.334 6.29	DUM 59080.38 5.63	NDQ 59145.3 <13.7	PGT 59171.4 10.7
DUM 59099.4 6.8	=====	KCH 59097.348 6.28	KCH 59082.355 4.8	PGT 59162.3 <12.8	PGT 59176.4 10.7
DUM 59105.4 6.57	BDJ 59137.3745 N 14.19	KCH 59097.358 6.3	DUM 59082.38 5.64	=====	PGT 59181.4 11.1
DUM 59106.4 6.56	NDQ 59159.3 <13.0	KCH 59098.334 6.28	DUM 59083.41 5.59	1859-05 VAQL	PGT 59194.3 10.5
DUM 59107.32 6.7	=====	KCH 59098.342 6.23	KCH 59084.344 4.93	=====	PGT 59202.3 10.5
DUM 59114.33 7.01	1820+39 TWLYR	KCH 59099.348 6.36	DUM 59088.44 5.75	PGT 59135.4 7.1	PGT 59210.3 10.7
=====	=====	KCH 59099.353 6.27	KCH 59089.381 4.8	PGT 59141.3 7.1	=====
1717+07 UZOPH	BDJ 59137.3875 N 14.06	KCH 59100.333 6.29	KCH 59092.356 4.8	PGT 59153.3 7.2	1915+17 WSGE
=====	NDQ 59159.3 <13.5	KCH 59100.349 6.29	KCH 59093.344 4.8	PGT 59166.3 7.1	=====
PGT 59174.2 10.8	=====	KCH 59103.338 6.25	KCH 59094.347 4.7	PGT 59174.2 7.1	JPS 59140.34 11.0
=====	1821+72 RTDRA	KCH 59103.345 6.23	KCH 59096.353 4.8	PGT 59179.2 7.1	=====
1717+23 RSHER	=====	KCH 59103.359 6.27	DUM 59096.41 5.71	=====	1916+37 ULYR
=====	JPS 59172.33 10.2	KCH 59104.34 6.28	KCH 59097.326 4.91	1901+08 RAQL	=====
PGT 59135.3 11.6	=====	KCH 59104.354 6.27	KCH 59098.334 4.91	=====	BDJ 59137.43 N 11.24
PGT 59141.3 10.8	1822+24 SVHER	KCH 59104.358 6.27	DUM 59098.41 5.74	PGT 59154.3 6.4	PGT 59141.4 11.3
PGT 59154.3 9.6	=====	KCH 59105.322 6.25	KCH 59099.328 4.97	=====	NDQ 59144.3 12.1
PGT 59163.2 9.4	PGT 59141.3 <13.4	KCH 59105.363 6.23	DUM 59099.42 5.8	1903+17 SVSGE	PGT 59153.3 11.3
PGT 59166.3 9.3	PGT 59163.3 <12.5	KCH 59105.366 6.23	KCH 59100.338 4.8	=====	BDJ 59181.339 N 11.03
PGT 59172.3 9.3	PGT 59179.2 12.0	KCH 59106.355 6.26	KCH 59101.331 4.93	PGT 59128.4 11.1	=====
PGT 59179.2 8.8	=====	KCH 59106.387 6.26	KCH 59103.34 5.47	PGT 59135.4 11.0	1918+31 ANLYR
=====	1826+21 ACHER	KCH 59108.322 6.26	KCH 59104.333 5.47	PGT 59163.3 10.7	=====
1722+04 VWOPH	=====	KCH 59108.324 6.25	KCH 59105.317 5.28	PGT 59176.2 11.1	BDJ 59137.4227 N 11.51
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JPS 59140.29 12.5	PGT 59163.3 7.7	KCH 59109.306 6.23	KCH 59106.354 5.2	=====	BDJ 59181.331 N 13.9
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1725+17 UZHER	PGT 59179.2 8.5	KCH 59110.327 6.26	KCH 59108.321 5.4	=====	1919+29 BFCYG
=====	=====	KCH 59110.333 6.26	DUM 59108.44 5.83	BDJ 59137.4138 N 11.22	=====
PGT 59141.3 9.5	1828+36 TLVR	KCH 59110.35 6.25	KCH 59109.326 5.71	PGT 59141.4 11.0	PGT 59153.4 10.2
JPS 59142.29 9.4	=====	KCH 59113.378 6.28	KCH 59110.32 5.85	PGT 59153.3 10.9	PGT 59162.4 9.8
=====	PGT 59128.4 8.2	KCH 59114.303 6.25	DUM 59110.39 5.84	PGT 59162.3 10.9	PGT 59172.3 9.7
1728+09 RUOPH	PGT 59135.4 8.2	KCH 59114.331 6.23	KCH 59114.302 5.76	PGT 59168.3 11.1	PGT 59179.3 9.7
=====	PGT 59141.4 8.4	KCH 59114.378 6.23	DUM 59114.36 5.8	PGT 59174.3 11.2	=====
PGT 59174.3 11.3	NDQ 59144.3 9.1	KCH 59114.383 6.26	KCH 59115.347 5.88	PGT 59179.3 11.6	1921+21 WWWUL
=====	PGT 59153.3 8.3	KCH 59115.348 6.23	DUM 59117.42 5.84	BDJ 59181.324 N 11.31	=====
1744+22 SUHER	PDJ 59160.2583 Y 8.7	KCH 59115.364 6.25	KCH 59133.294 6.8	=====	PGT 59135.3756 10.5
=====	PGT 59162.3 8.2	KCH 59133.293 6.31	KCH 59134.294 6.9	1905+29 VLVR	PGT 59141.3868 10.5
JPS 59142.3 13.4	PGT 59168.2 8.4	KCH 59134.291 6.33	PGT 59135.4 7.3	=====	PGT 59153.3493 10.6
=====	PGT 59174.3 8.3	KCH 59134.328 6.33	PGT 59141.3 8.4	BDJ 59137.4084 N 11.1	PGT 59162.343 10.9
1755+19 RYHER	PGT 59179.3 8.4	KCH 59134.335 6.28	PGT 59153.3 8.0	PGT 59141.4 11.3	PGT 59163.3395 10.8
=====	PGT 59194.3 8.3	KCH 59134.343 6.31	KCH 59159.244 8.3	JPS 59142.31 11.0	PGT 59168.3263 10.5
PGT 59141.3 9.1	PGT 59202.3 8.4	KCH 59157.268 6.39	PGT 59162.3 7.8	NDQ 59144.3 11.5	PGT 59176.2486 10.6
JPS 59142.31 8.6	=====	KCH 59157.331 6.36	PGT 59166.2 7.4	PGT 59153.3 11.2	PGT 59181.2437 10.6
PGT 59163.3 9.4	1831+46 SZLYR	KCH 59157.42 6.4	PGT 59174.2 7.2	PGT 59162.3 11.1	=====
PGT 59168.2 9.4	=====	KCH 59158.272 6.3	PGT 59179.2 7.0	BDJ 59181.317 N 11.73	1921+50 CHCYG
PGT 59179.2 9.5	PGT 59128.4 11.2	KCH 59158.325 6.31	=====	=====	=====
=====	BDJ 59137.4261 N 11.49	KCH 59158.333 6.31	1842+43 RWLYR	1905+29 VZLYR	PGT 59130.6 7.4

SUM 59141.2932 M 8.44	SUM 59131.2829 O 9.7	SUM 59137.3064 M 13.91	PGT 59181.3 9.2	2016+21 PUVUL	PGT 59176.4 <11.8
SUM 59141.2958 N 7.11	SUM 59131.2868 N 12.31	SUM 59137.3086 N 12.07	=====	=====	PGT 59181.3 <12.7
SUM 59141.2984 O 5.74	=====	SUM 59140.2983 N 11.89	2007+20 STSGE	PGT 59141.3972 :13.2	=====
SUM 59142.2544 M 8.31	1934+28 BGCYG	SUM 59140.2996 M 14.3	=====	PGT 59153.3611 :13.0	2039+37 DRCYG
SUM 59142.2582 N 7.09	=====	SUM 59140.3042 O 8.52	JPS 59140.33 10.3	PGT 59163.3465 <12.6	=====
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JTP 59158.5 :7.1	PGT 59172.3 11.9	SUM 59141.31 N 11.79	=====	2016+47 UCYG	PGT 59202.3 9.9
PGT 59162.4 7.5	PGT 59179.3 11.8	SUM 59141.3133 O 8.33	PGT 59163.3 <12.3	=====	=====
PGT 59167.4 7.4	=====	SUM 59141.315 P 4.53	=====	BDJ 59137.4485 N 9.29	2040+16 TDEL
PGT 59171.4 7.4	1934+49 RCYG	SUM 59149.2354 M 13.77	2009-06 ZAQL	PGT 59153.4 9.2	=====
PGT 59176.4 7.4	=====	SUM 59149.2397 N 11.3	=====	PGT 59162.4 9.4	NDQ 59134.3 12.6
JTP 59176.4 :7.1	KCH 59092.362 6.7	SUM 59149.2427 O 7.92	JPS 59140.3 10.8	PGT 59167.4 9.5	JPS 59165.28 11.3
PGT 59181.4 7.4	KCH 59094.353 6.9	NDQ 59182.3 9.8	=====	PGT 59171.4 9.6	NDQ 59166.3 12.0
NDQ 59188.3 7.7	KCH 59095.343 7.37	PGT 59202.3 9.3	2009+16 RSGE	PGT 59176.4 9.6	JPS 59171.29 12.0
PGT 59194.3 7.6	KCH 59097.351 7.35	=====	=====	BDJ 59181.368 N 9.92	PGT 59176.4 11.8
PGT 59202.3 7.7	PGT 59130.6 7.6	1946+35 CICYG	PGT 59135.4 9.1	PGT 59181.4 9.6	=====
PGT 59210.3 7.7	PGT 59153.4 8.1	=====	PGT 59141.4 9.1	PGT 59202.3 9.6	2040+17 UDEL
=====	PGT 59162.4 8.7	PGT 59153.4 8.1	PGT 59153.4 9.1	PGT 59213.3 10.2	=====
1922+01 TUAQL	PGT 59167.4 8.9	PGT 59162.4 11.1	PGT 59162.3 9.3	=====	NDQ 59134.3 6.5
=====	PGT 59171.4 8.9	PGT 59172.3 11.2	PGT 59168.3 9.6	2020+41 V1515CYG	PGT 59154.4 6.5
PGT 59154.3 9.3	JTP 59176.4 9.8	PGT 59202.3 11.2	PGT 59176.3 9.5	=====	PGT 59163.4 6.7
=====	PGT 59176.4 9.0	=====	PGT 59181.3 9.2	PGT 59172.3 <13.5	NDQ 59166.3 6.6
1925+45 AWCYG	BDJ 59181.389 N 8.99	1949+09 RZAQL	2009+38 RSCYG	=====	PGT 59181.3 6.5
=====	PGT 59181.4 9.2	PGT 59181.3 11.1	=====	2025+09 RYDEL	=====
PGT 59153.4 8.8	PGT 59194.3 9.3	=====	PGT 59153.4 8.3	NDQ 59166.3 <13.6	2041-04 WAQR
PGT 59162.4 8.8	PGT 59202.3 9.9	=====	PGT 59163.4 8.4	=====	JPS 59166.33 12.8
PGT 59167.4 8.7	PGT 59210.3 9.9	1951+36 IZCYG	PGT 59167.4 8.5	2025+12 RXDEL	=====
PGT 59171.4 8.6	=====	=====	PGT 59171.4 8.4	=====	2041+04 BRDEL
PGT 59176.4 8.6	1935+09 RVAQL	PGT 59172.3 12.9	PGT 59181.4 8.8	PGT 59154.4 11.1	=====
PGT 59181.4 8.6	=====	PGT 59202.3 :12.9	PGT 59202.3 8.2	JPS 59165.28 10.7	JPS 59140.32 12.0
NDQ 59188.3 <8.7	PGT 59163.3 12.1	=====	=====	NDQ 59166.3 10.1	PGT 59163.4 <12.4
PGT 59194.3 8.4	PGT 59181.3 10.5	1952+77 ABDRA	2010+08 RDEL	JPS 59171.3 10.4	=====
PGT 59202.3 8.4	=====	PDJ 59172.2625 Y 14.18	=====	PGT 59176.3 10.7	2042+31 GPCYG
=====	1939+27 YZVUL	=====	NDQ 59134.3 12.0	PGT 59181.3 10.3	=====
1927+34 DDCYG	=====	1953+39 V1016CYG	PGT 59154.4 11.3	=====	NDQ 59134.3 12.6
=====	PGT 59172.3 <13.3	=====	PGT 59163.4 10.6	2025+74 UUDRA	NDQ 59144.3 12.2
PGT 59163.4 10.7	=====	PGT 59172.4 11.3	NDQ 59166.3 11.2	=====	NDQ 59159.3 12.3
PGT 59167.4 10.6	1939+54 V369CYG	=====	PGT 59176.3 9.8	PGT 59174.6 9.7	NDQ 59166.3 12.1
PGT 59172.3 10.7	=====	1956+35 KMCYG	PGT 59181.3 9.2	=====	=====
PGT 59202.3 9.8	PGT 59181.4 10.2	=====	2011+30 SKCYG	2026+11 RZDEL	2043+18 VDEL
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1927+45 AFCYG	=====	PGT 59162.4 :13.0	PGT 59202.3 <12.7	=====	NDQ 59134.3 <14.2
=====	1940+48 RTCYG	PGT 59167.4 :13.0	=====	2028+17 ZDEL	NDQ 59166.3 <13.9
DUM 59032.43 7.8	=====	PGT 59172.3 <13.0	2012+09 RUDEL	=====	2044-05 TAQR
DUM 59037.45 7.74	PGT 59153.4 11.6	=====	=====	JPS 59140.31 9.8	=====
DUM 59040.43 7.78	PGT 59162.4 11.2	1958+49 ZCYG	NDQ 59166.3 11.7	PGT 59154.4 10.1	JPS 59142.34 7.6
DUM 59042.46 7.78	PGT 59167.4 11.0	=====	=====	PGT 59163.4 10.3	JPS 59166.33 8.9
DUM 59049.45 7.76	PGT 59171.4 10.9	PGT 59153.4 8.6	2012+47 V1488CYG	NDQ 59166.3 10.2	=====
DUM 59052.4 8.28	PGT 59176.4 10.7	PGT 59162.4 8.7	=====	PGT 59176.3 11.5	2048+43 V751CYG
DUM 59053.44 8.33	PGT 59181.4 9.9	PGT 59167.4 8.9	JTP 59134.5 :4.1	=====	=====
DUM 59055.47 7.96	PGT 59194.3 9.1	JTP 59171.4 9.1	JTP 59141.4 4.2	2029+62 BFCEP	CAS 59130.311 Q 14.6
DUM 59057.45 7.85	PGT 59202.3 8.5	PGT 59176.4 9.4	JTP 59144.3 4.3	=====	CAS 59141.278 Q 14.7
DUM 59060.41 7.77	PGT 59210.3 7.5	BDJ 59181.391 N 9.9	JTP 59157.5 4.2	PDJ 59163.2757 Y 12.64	=====
DUM 59068.36 7.77	=====	PGT 59181.4 9.7	JTP 59181.4 4.2	=====	2050+17 XDEL
DUM 59069.43 7.75	1943+48 TUCYG	PGT 59202.3 11.5	JTP 59199.4 :4.2	2036+11 YDEL	=====
DUM 59070.36 7.75	=====	PGT 59213.3 :12.5	=====	=====	NDQ 59134.3 <13.2
DUM 59073.39 7.76	PGT 59176.4 <12.5	=====	2012+76 SZCEP	PGT 59154.4 12.0	NDQ 59166.3 <13.6
DUM 59076.4 7.75	PGT 59194.3 <12.2	2002+09 HIAQL	=====	JPS 59159.27 12.5	=====
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59134.34 7.47	59110.352 7.3	59153.2621 N 18.8	NDQ 59144.3076 13.5	59174.442 M 15.98	59174.3293 Q 18.71
59158.277 7.3	59114.304 7.3	59153.2683 O 17.57	=====	59174.455 P 14.68	59176.3537 Q 19.0
59158.331 7.3	59114.335 7.3	59153.2734 P 16.77	XXXXXXXX SN2020UXZ	59174.466 N 15.02	=====
59159.253 7.3	59114.38 7.43	=====	=====	=====	XXXXXXXX T2020aapw
=====	59134.304 7.3	XXXXXXXX AT2020yug	59147.4065 O 13.75	XXXXXXXX SN2020uxz	=====
XXXXXXXX V2120CYG	59134.333 7.47	=====	59147.4155 P 14.46	=====	59174.354 Q 17.06
=====	59134.34 7.47	59157.3727 Q 18.6	59147.4208 M 13.89	59175.4555 M 16.17	59174.378 O 17.12
59067.386 7.3	59157.422 7.3	59159.4035 Q 19.4	59147.47 N 13.66	59175.4641 N 15.03	59175.4277 Q 18.02
59067.393 6.63	59158.276 7.3	=====	59147.484 M 13.78	59175.4703 O 14.85	=====
59068.39 7.3	59158.33 7.4	XXXXXXXX AT2020yye	59147.496 P 14.36	59175.4757 P 14.81	XXXXXXXX T2020AAVG
59069.388 7.8	59159.253 7.3	=====	59147.505 O 13.75	59183.3444 M 16.43	=====
59074.382 6.59	=====	59166.3982 Q 16.48	59149.4278 M 14.01	59183.3502 N 15.6	59168.247 R:19.4
59082.345 7.63	XXXXXXXX -2020-09C	59168.3751 M 17.23	59149.4351 N 13.74	59183.356 O 15.33	
59082.392 7.51	=====	59168.41 O 16.56	59149.44 O 13.9	59183.3617 P 15.34	