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## **Orbital elements of double stars: ADS 3210, ADS 5408, ADS 9301, ADS 9692**

Marco Scardia, Jean-Louis Prieur, Luigi Pansecchi, Josefina Ling, Robert W. Argyle, Eric Aristidi, Alessio Zanutta, Luca Maccarini, Lyu Abe, Philippe Bendjoya, et al.

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INTERNATIONAL ASTRONOMICAL UNION  
 COMMISSION G1 (BINARY AND MULTIPLE STAR SYSTEMS)  
 DOUBLE STARS INFORMATION CIRCULAR No. 201 (JUNE 2020)

NEW ORBITS

| ADS<br>$\alpha$ 2000 $\delta$ | Name<br>n           | P<br>a                        | T<br>i           | e<br>$\omega$  | $\Omega$ (2000)<br>Last ob. | 2020<br>2021               | Author(s)             |
|-------------------------------|---------------------|-------------------------------|------------------|----------------|-----------------------------|----------------------------|-----------------------|
| -<br>00090-5400               | HDO 181<br>1°7831   | 2018 <sup>y</sup> 9<br>0''400 | 1981.29<br>158°6 | 0.380<br>13°2  | 141°5<br>2018.73            | 13°3 0''384<br>11.6 0.390  | ALZNER<br>et al. (1)  |
| -<br>00465-0131               | RST 4157<br>3.7971  | 94.8<br>0.161                 | 2008.20<br>59.0  | 0.647<br>200.6 | 97.8<br>2019.540            | 77.3 0.125<br>79.6 0.135   | TOKOVININ             |
| -<br>03087-4413               | HDS 398<br>2.1176   | 170.0<br>0.235                | 2003.37<br>109.7 | 0.462<br>39.8  | 243.1<br>2018.807           | 89.5 0.111<br>86.9 0.120   | TOKOVININ             |
| -<br>03178-1407               | HU 432<br>4.8866    | 73.67<br>0.202                | 1979.23<br>40.4  | 0.152<br>223.2 | 45.4<br>2019.857            | 95.6 0.193<br>99.7 0.190   | TOKOVININ             |
| 3210<br>04259+1852            | BU 1185<br>13.0814  | 27.52<br>0.250                | 2030.53<br>97.2  | 0.038<br>327.2 | 23.3<br>2020.059            | 202.5 0.256<br>200.8 0.242 | SCARDIA<br>et al. (2) |
| -<br>04507-8202               | HDS 625<br>3.0981   | 116.2<br>0.245                | 2017.9<br>97.5   | 0.800<br>102.5 | 306.1<br>2020.111           | 126.6 0.072<br>124.3 0.087 | TOKOVININ             |
| 3614<br>05017+2050            | HU 445 AB<br>4.3247 | 83.24<br>0.573                | 2016.75<br>69.0  | 0.837<br>276.2 | 154.1<br>2018.972           | 167.2 0.237<br>171.6 0.261 | TOKOVININ             |
| -<br>05047+7404               | STT 89<br>2.5586    | 140.7<br>0.373                | 1919.08<br>83.6  | 0.878<br>50.9  | 111.9<br>2003.96            | 304.0 0.288<br>304.2 0.281 | ALZNER                |
| -<br>05091-4201               | HDS 676<br>4.5125   | 79.78<br>0.239                | 2017.47<br>66.5  | 0.500<br>222.8 | 159.1<br>2020.018           | 46.2 0.055<br>77.1 0.055   | TOKOVININ             |
| -<br>05102-7236               | WSI 122<br>5.5385   | 65.0<br>0.769                 | 2009.03<br>131.7 | 0.641<br>153.3 | 165.7<br>2019.947           | 228.9 0.587<br>224.4 0.631 | TOKOVININ             |
| -<br>05249-5810               | I 390<br>0.6000     | 600.<br>0.468                 | 2069.0<br>70.4   | 0.600<br>205.0 | 266.2<br>2019.950           | 40.5 0.144<br>42.2 0.146   | TOKOVININ             |

**NEW ORBITS (continuation)**

| <b>ADS<br/><math>\alpha</math>2000<math>\delta</math></b> | <b>Name<br/>n</b>   | <b>P<br/>a</b> | <b>T<br/>i</b>   | <b>e<br/><math>\omega</math></b> | <b><math>\Omega</math>(2000)<br/>Last ob.</b> | <b>2019<br/>2020</b>       | <b>Author(s)</b>      |
|-----------------------------------------------------------|---------------------|----------------|------------------|----------------------------------|-----------------------------------------------|----------------------------|-----------------------|
| 4373<br>05472+2153                                        | HU 39<br>7.6320     | 47.17<br>0.267 | 1975.23<br>99.2  | 0.260<br>195.1                   | 41.0<br>2020.10                               | 223.7 0.196<br>221.6 0.199 | ALZNER                |
| -<br>05498-7225                                           | TOK 431<br>20.0000  | 18.0<br>0.147  | 2022.45<br>128.3 | 0.170<br>124.8                   | 145.2<br>2020.111                             | 99.2 0.099<br>64.2 0.079   | TOKOVININ             |
| -<br>05505-5246                                           | B 1493<br>3.1858    | 113.0<br>0.163 | 2005.0<br>140.5  | 0.670<br>170.2                   | 247.9<br>2019.950                             | 301.8 0.129<br>299.1 0.136 | TOKOVININ             |
| 4604<br>06032+5813                                        | A 1315<br>0.6000    | 600.<br>1.135  | 2000.8<br>78.0   | 0.860<br>64.6                    | 91.8<br>2016.953                              | 272.1 0.485<br>272.4 0.502 | DOCOBO<br>& LING      |
| -<br>06234-3001                                           | DAW 120<br>0.9600   | 375.0<br>0.407 | 2034.82<br>83.8  | 0.270<br>145.4                   | 84.8<br>2019.952                              | 254.1 0.154<br>254.8 0.161 | TOKOVININ             |
| 5408<br>06455+2922                                        | A 122<br>3.5191     | 102.3<br>0.334 | 1976.99<br>113.7 | 0.647<br>228.5                   | 40.9<br>2020.042                              | 22.0 0.435<br>21.4 0.432   | SCARDIA<br>et al. (2) |
| 5857<br>07113-1032                                        | A 2122<br>1.3662    | 263.5<br>0.192 | 2021.72<br>136.8 | 0.582<br>187.7                   | 144.2<br>2019.210                             | 326.4 0.081<br>321.8 0.081 | TOKOVININ             |
| 07303-5657                                                | FIN 105<br>2.1176   | 170.0<br>0.244 | 2046.15<br>153.5 | 0.578<br>107.1                   | 52.1<br>2018.2355                             | 67.4 0.238<br>65.7 0.233   | DOCOBO<br>et al. (3)  |
| 07427-3510                                                | HDS 1091<br>1.3091  | 275.0<br>0.332 | 2017.40<br>115.2 | 0.690<br>200.2                   | 93.3<br>2018.8438                             | 250.1 0.082<br>242.9 0.075 | DOCOBO<br>et al. (3)  |
| -<br>08259-1623                                           | HDS 1199<br>1.0000  | 360.0<br>1.441 | 2013.15<br>180.0 | 0.590<br>0.0                     | 178.6<br>2018.073                             | 147.1 0.627<br>142.9 0.637 | TOKOVININ             |
| -<br>08394-3636                                           | I 314<br>5.4720     | 65.79<br>0.565 | 1990.84<br>99.0  | 0.824<br>339.7                   | 57.5<br>2018.236                              | 241.5 0.937<br>241.3 0.947 | TOKOVININ             |
| -<br>09074-4357                                           | B 1646 AB<br>1.7308 | 208.0<br>0.188 | 2029.45<br>116.2 | 0.600<br>161.1                   | 15.9<br>2019.953                              | 278.3 0.044<br>266.9 0.044 | TOKOVININ             |
| 7225<br>09110-1929                                        | I 824<br>0.3830     | 940.<br>0.492  | 2029.4<br>130.3  | 0.869<br>18.0                    | 116.5<br>2018.2358                            | 162.1 0.076<br>156.8 0.074 | DOCOBO<br>et al. (3)  |
| -<br>09149+0427                                           | HEI 350<br>6.5018   | 55.37<br>0.937 | 1969.13<br>125.5 | 0.600<br>72.8                    | 344.0<br>2019.371                             | 358.3 0.609<br>350.5 0.557 | TOKOVININ             |

**NEW ORBITS (continuation)**

| <b>ADS<br/><math>\alpha</math>2000<math>\delta</math></b> | <b>Name<br/>n</b>       | <b>P<br/>a</b>  | <b>T<br/>i</b>    | <b>e<br/><math>\omega</math></b> | <b><math>\Omega</math>(2000)<br/>Last ob.</b> | <b>2019<br/>2020</b>       | <b>Author(s)</b>     |
|-----------------------------------------------------------|-------------------------|-----------------|-------------------|----------------------------------|-----------------------------------------------|----------------------------|----------------------|
| -<br>09370-2610                                           | WSI 127<br>11.2585      | 32.0<br>0.391   | 2010.47<br>0.0    | 0.000<br>0.0                     | 284.0<br>2019.950                             | 31.3 0.391<br>42.6 0.391   | TOKOVININ            |
| 7541<br>09512+3629                                        | HO 369<br>3.0483        | 118.1<br>0.247  | 1923.62<br>74.9   | 0.847<br>327.3                   | 289.8<br>2020.28                              | 107.0 0.318<br>107.3 0.311 | ALZNER I             |
| 7541<br>09512+3629                                        | HO 369<br>0.3273        | 1100.<br>1.100  | 1961.6<br>85.0    | 0.668<br>329.5                   | 99.2<br>2020.28                               | 107.2 0.319<br>107.5 0.315 | ALZNER II            |
| -<br>10038-0823                                           | HDS 1454<br>11.0898     | 32.46<br>0.086  | 2010.87<br>128.3  | 0.700<br>335.3                   | 175.0<br>2020.112                             | 27.9 0.103<br>24.7 0.111   | TOKOVININ            |
| -<br>10043-2823                                           | I 292<br>0.9474         | 380.0<br>0.869  | 1971.25<br>142.9  | 0.718<br>71.7                    | 139.8<br>2020.200                             | 298.9 0.810<br>298.3 0.818 | TOKOVININ            |
| 7674<br>10116+1321                                        | HU 874 AB<br>20.0423    | 17.962<br>0.117 | 2022.828<br>78.5  | 0.930<br>355.2                   | 106.2<br>2019.3816                            | 288.4 0.147<br>289.6 0.112 | DOCOBO<br>et al. (3) |
| -<br>10161-2837                                           | TOK 199<br>142.4197     | 2.528<br>0.044  | 2014.907<br>115.5 | 0.309<br>58.6                    | 95.7<br>2019.377                              | 47.0 0.016<br>255.5 0.046  | TOKOVININ            |
| 7738<br>10217-0946                                        | BU 25<br>0.2687         | 1340.<br>2.546  | 1960.5<br>133.9   | 0.297<br>20.3                    | 168.2<br>2018.1811                            | 128.1 1.535<br>127.6 1.532 | DOCOBO<br>et al. (3) |
| 7929<br>10480+4107                                        | STT 229<br>1.0733       | 335.4<br>0.639  | 2077.4<br>154.0   | 0.472<br>285.7                   | 64.1<br>2018.77                               | 254.2 0.630<br>253.4 0.624 | ALZNER               |
| -<br>11192-1950                                           | TOK 383Aa,Ab<br>37.4904 | 9.602<br>0.042  | 2020.236<br>130.4 | 0.521<br>219.0                   | 30.8<br>2020.019                              | 206.1 0.021<br>77.6 0.022  | TOKOVININ            |
| 12111-5302                                                | HU 1604<br>1.7561       | 205.<br>0.341   | 2049.0<br>55.6    | 0.431<br>32.7                    | 89.2<br>2018.1621                             | 34.2 0.194<br>37.0 0.195   | DOCOBO<br>et al. (3) |
| -<br>12157-8047                                           | FIN 195<br>1.2857       | 280.0<br>0.322  | 2032.74<br>60.0   | 0.754<br>44.6                    | 96.1<br>2019.374                              | 58.9 0.112<br>62.4 0.111   | TOKOVININ            |
| -<br>12283-6146                                           | RST 4499 BC<br>12.8448  | 28.027<br>0.227 | 1990.024<br>152.9 | 0.174<br>80.5                    | 169.1<br>2020.112                             | 50.3 0.175<br>32.7 0.187   | TOKOVININ            |
| -<br>12358-6150                                           | RST 4503<br>1.2000      | 300.0<br>0.210  | 1729.08<br>53.0   | 0.317<br>25.0                    | 120.9<br>2020.112                             | 122.8 0.146<br>124.2 0.145 | TOKOVININ            |

**NEW ORBITS (continuation)**

| <b>ADS</b><br>$\alpha 2000\delta$ | <b>Name</b><br><b>n</b>  | <b>P</b><br><b>a</b> | <b>T</b><br><b>i</b> | <b>e</b><br>$\omega$ | $\Omega(2000)$<br><b>Last ob.</b> | <b>2019</b><br><b>2020</b> | <b>Author(s)</b>        |
|-----------------------------------|--------------------------|----------------------|----------------------|----------------------|-----------------------------------|----------------------------|-------------------------|
| -<br>12455-4552                   | HDS 1789 Aa,Ab<br>9.9079 | 36.34<br>0.161       | 2019.77<br>38.0      | 0.250<br>239.1       | 63.8<br>2020.117                  | 300.9 0.101<br>321.0 0.097 | TOKOVININ               |
| -<br>12463-6050                   | B 1722<br>1.2000         | 300.0<br>0.333       | 2016.63<br>47.1      | 0.906<br>97.8        | 32.7<br>2020.112                  | 225.7 0.070<br>232.5 0.081 | TOKOVININ               |
| 13117-2633                        | FIN 305<br>17.9336       | 20.074<br>0.226      | 2021.801<br>114.4    | 0.989<br>91.7        | 8.4<br>2019.0494                  | 74.5 0.099<br>66.0 0.064   | DOCOBO I<br>et al. (3)  |
| 13117-2633                        | FIN 305<br>8.8452        | 40.700<br>0.219      | 2006.500<br>98.6     | 0.045<br>304.5       | 93.3<br>2019.0494                 | 72.7 0.089<br>61.1 0.062   | DOCOBO II<br>et al. (3) |
| -<br>13132-0501                   | TOK 402<br>17.6865       | 20.35<br>0.163       | 2016.72<br>112.1     | 0.627<br>254.4       | 114.0<br>2020.019                 | 103.5 0.155<br>98.2 0.164  | TOKOVININ               |
| -<br>13137-6248                   | HDS 1852<br>13.9549      | 25.80<br>0.151       | 2001.34<br>57.7      | 0.240<br>182.5       | 140.7<br>2020.112                 | 181.1 0.116<br>196.2 0.096 | TOKOVININ               |
| -<br>13191-5239                   | I 516<br>1.2000          | 300.0<br>0.770       | 2083.04<br>89.0      | 0.653<br>238.9       | 186.5<br>2020.117                 | 353.0 0.070<br>354.7 0.079 | TOKOVININ               |
| -<br>13194-3957                   | RST 1712<br>1.6405       | 219.4<br>0.590       | 2021.85<br>160.1     | 0.396<br>237.8       | 138.8<br>2017.534                 | 270.3 0.345<br>266.1 0.343 | TOKOVININ               |
| 8863<br>13203+1746                | A 2166<br>32.0618        | 11.228<br>0.098      | 2007.128<br>67.8     | 0.823<br>314.9       | 197.9<br>2020.117                 | 323.6 0.050<br>340.2 0.079 | TOKOVININ               |
| -<br>13217-3919                   | HDS 1875<br>9.4459       | 38.11<br>0.205       | 2019.61<br>117.5     | 0.550<br>228.0       | 189.2<br>2020.019                 | 326.7 0.057<br>262.6 0.050 | TOKOVININ               |
| 13305+0729                        | A 1789<br>2.5098         | 143.44<br>0.191      | 1962.71<br>137.8     | 0.420<br>105.4       | 67.9<br>2018.2361                 | 159.6 0.195<br>158.0 0.196 | DOCOBO<br>et al. (3)    |
| 9301<br>14323+2641                | A 570<br>12.0421         | 29.90<br>0.204       | 2013.76<br>152.9     | 0.167<br>49.6        | 15.6<br>2020.338                  | 228.6 0.193<br>217.5 0.204 | SCARDIA<br>et al. (2)   |
| -<br>14332-6935                   | HDS 2055<br>4.5000       | 80.0<br>0.220        | 2051.67<br>103.2     | 0.400<br>261.8       | 132.1<br>2020.201                 | 5.1 0.084<br>359.1 0.090   | TOKOVININ               |
| 14516-4335                        | FIN 319<br>10.8346       | 33.23<br>0.239       | 2028.75<br>80.6      | 0.315<br>28.1        | 104.5<br>2019.3817                | 328.3 0.062<br>8.4 0.042   | DOCOBO<br>et al. (3)    |

**NEW ORBITS (continuation)**

| <b>ADS</b><br>$\alpha 2000\delta$ | <b>Name</b><br><b>n</b>  | <b>P</b><br><b>a</b> | <b>T</b><br><b>i</b> | <b>e</b><br>$\omega$ | $\Omega(2000)$<br><b>Last ob.</b> | <b>2019</b><br><b>2020</b> | <b>Author(s)</b>      |
|-----------------------------------|--------------------------|----------------------|----------------------|----------------------|-----------------------------------|----------------------------|-----------------------|
| 14592-4206                        | HDS 2116 Aa,Ab<br>6.1523 | 58.52<br>0.287       | 2011.10<br>90.9      | 0.304<br>215.1       | 156.4<br>2019.3798                | 157.7 0.145<br>157.4 0.176 | DOCOBO<br>et al. (3)  |
| 9528<br>15106+2021                | HU 144<br>0.8727         | 412.5<br>1.128       | 2130.71<br>87.3      | 0.807<br>253.7       | 232.9<br>2019.377                 | 333.1 0.083<br>337.5 0.084 | TOKOVININ             |
| 9552<br>15157-2736                | BU 350<br>0.2156         | 1670.<br>1.902       | 2018.9<br>138.7      | 0.918<br>40.8        | 41.0<br>2018.1814                 | 354.4 0.133<br>340.9 0.130 | DOCOBO<br>et al. (3)  |
| -<br>15282-0626                   | HDS 2175<br>2.6332       | 136.7<br>0.464       | 1993.77<br>66.2      | 0.340<br>159.4       | 173.4<br>2020.117                 | 77.9 0.186<br>84.0 0.188   | TOKOVININ             |
| 9692<br>15328+1945                | HU 577<br>3.3272         | 108.2<br>0.294       | 1944.45<br>61.9      | 0.392<br>127.1       | 35.6<br>2020.420                  | 27.8 0.352<br>28.9 0.350   | SCARDIA<br>et al. (2) |
| -<br>15428-6147                   | HDS 2218<br>6.0000       | 60.0<br>0.114        | 2024.67<br>143.2     | 0.426<br>287.9       | 72.3<br>2020.112                  | 217.4 0.073<br>205.7 0.066 | TOKOVININ             |
| 9797<br>15493+0503                | A 1126<br>1.2457         | 289.0<br>0.197       | 1999.1<br>63.5       | 0.647<br>357.9       | 34.4<br>2019.5387                 | 140.3 0.059<br>144.8 0.062 | DOCOBO<br>et al. (3)  |
| -<br>15544-6131                   | HDS 2240<br>4.5000       | 80.0<br>0.191        | 2020.49<br>0.0       | 0.830<br>0.0         | 182.8<br>2020.201                 | 143.1 0.036<br>223.5 0.036 | TOKOVININ             |
| -<br>16020-3042                   | B 1313<br>2.4000         | 150.0<br>0.234       | 2033.83<br>78.2      | 0.464<br>193.2       | 151.2<br>2020.112                 | 304.1 0.072<br>308.3 0.079 | TOKOVININ             |
| -<br>16263-0943                   | RST 3945<br>2.7211       | 132.3<br>0.355       | 1921.19<br>53.1      | 0.161<br>58.4        | 51.2<br>2018.181                  | 14.9 0.287<br>17.3 0.291   | TOKOVININ             |
| -<br>16274-3729                   | B 872<br>2.0072          | 179.4<br>0.398       | 1977.70<br>108.6     | 0.508<br>146.3       | 132.9<br>2018.181                 | 184.7 0.186<br>182.3 0.194 | TOKOVININ             |
| -<br>16302-1440                   | WSI 132<br>14.1812       | 25.39<br>0.321       | 2021.13<br>127.9     | 0.521<br>315.4       | 11.2<br>2020.201                  | 114.3 0.111<br>48.6 0.121  | TOKOVININ             |
| 10143<br>16402-2800               | VOU 44 AB<br>3.4392      | 104.7<br>0.192       | 2067.0<br>41.0       | 0.204<br>154.0       | 13.4<br>2019.3773                 | 3.0 0.227<br>4.8 0.227     | DOCOBO<br>et al. (3)  |
| -<br>16536-1045                   | YSC 156<br>15.4123       | 23.36<br>0.089       | 2023.93<br>10.0      | 0.500<br>100.0       | 81.6<br>2020.201                  | 63.1 0.088<br>78.7 0.075   | TOKOVININ             |

**NEW ORBITS (continuation)**

| <b>ADS</b><br>$\alpha$ <b>2000</b> $\delta$ | <b>Name</b><br><b>n</b> | <b>P</b><br><b>a</b> | <b>T</b><br><b>i</b> | <b>e</b><br>$\omega$ | <b><math>\Omega</math>(2000)</b><br><b>Last ob.</b> | <b>2019</b><br><b>2020</b> | <b>Author(s)</b>     |
|---------------------------------------------|-------------------------|----------------------|----------------------|----------------------|-----------------------------------------------------|----------------------------|----------------------|
| -<br>16596-4117                             | B 1839 AB<br>4.1155     | 87.5<br>0.172        | 1961.4<br>180.0      | 0.360<br>0.0         | 348.7<br>2018.255                                   | 136.1 0.215<br>133.6 0.212 | TOKOVININ            |
| 10305<br>17012-1213                         | HU 163<br>2.2500        | 160.0<br>0.199       | 2009.02<br>93.8      | 0.730<br>28.6        | 154.7<br>2019.536                                   | 337.7 0.102<br>337.4 0.112 | TOKOVININ            |
| -<br>17315-6026                             | I 600<br>1.0782         | 333.9<br>0.500       | 2183.52<br>114.9     | 0.160<br>148.0       | 135.3<br>2017.284                                   | 148.5 0.520<br>148.1 0.523 | TOKOVININ            |
| -<br>17342-1910                             | B 1863 AB<br>3.0672     | 117.4<br>0.166       | 2010.25<br>62.6      | 0.900<br>260.0       | 69.4<br>2019.534                                    | 98.0 0.105<br>99.5 0.109   | TOKOVININ            |
| 17362-1752                                  | YSC 158<br>28.6853      | 12.550<br>0.072      | 2013.528<br>70.8     | 0.119<br>132.7       | 102.8<br>2019.3776                                  | 85.9 0.062<br>96.1 0.075   | DOCOBO<br>et al. (3) |
| -<br>18092+3129                             | COU 812<br>0.8174       | 440.4<br>1.555       | 2043.08<br>79.3      | 0.785<br>250.5       | 96.6 250.5<br>2016.646                              | 266.5 0.646<br>267.0 0.642 | LING<br>et al. (4)   |
| -<br>18126+1224                             | HDS 2570<br>4.2353      | 85.0<br>0.158        | 2009.87<br>73.0      | 0.450<br>149.6       | 132.2<br>2019.536                                   | 342.3 0.067<br>348.9 0.061 | TOKOVININ            |
| 18126+1224                                  | HDS 2570<br>9.2676      | 38.85<br>0.155       | 2016.14<br>80.5      | 0.382<br>168.8       | 145.8<br>2019.5363                                  | 343.4 0.058<br>358.9 0.038 | DOCOBO<br>et al. (3) |
| 11906<br>18591+2230                         | HU 332<br>0.2030        | 1773.7<br>2.338      | 1849.71<br>76.9      | 0.906<br>301.2       | 159.7<br>2016.603                                   | 269.0 0.528<br>269.4 0.531 | LING<br>et al. (4)   |
| -<br>19036-7224                             | HDS 2703<br>3.6000      | 100.0<br>0.319       | 2017.37<br>115.5     | 0.580<br>120.6       | 186.8<br>2019.375                                   | 14.7 0.141<br>8.9 0.157    | TOKOVININ            |
| -<br>20300-7739                             | HDS 2931<br>2.5714      | 140.0<br>0.213       | 2010.73<br>38.0      | 0.645<br>309.3       | 54.7<br>2019.375                                    | 92.0 0.119<br>96.8 0.123   | TOKOVININ            |
| -<br>20406+1539                             | HDS 2947<br>20.3533     | 17.688<br>0.139      | 2014.815<br>104.3    | 0.749<br>158.3       | 101.6<br>2019.539                                   | 113.1 0.169<br>111.1 0.192 | TOKOVININ            |
| -<br>21114-5220                             | HU 1626<br>2.3085       | 155.9<br>0.841       | 2049.18<br>149.9     | 0.610<br>160.0       | 127.0<br>2018.400                                   | 106.0 0.924<br>104.7 0.904 | TOKOVININ            |
| 14766<br>21133+4655                         | A 884<br>1.0405         | 346.0<br>0.470       | 1831.86<br>123.2     | 0.567<br>102.1       | 48.9<br>2016.606                                    | 109.0 0.441<br>108.5 0.442 | LING<br>et al. (4)   |

**NEW ORBITS (continuation)**

| <b>ADS<br/><math>\alpha</math>2000<math>\delta</math></b> | <b>Name<br/>n</b>   | <b>P<br/>a</b>   | <b>T<br/>i</b>    | <b>e<br/><math>\omega</math></b> | <b><math>\Omega</math>(2000)<br/>Last ob.</b> | <b>2019<br/>2020</b>       | <b>Author(s)</b> |
|-----------------------------------------------------------|---------------------|------------------|-------------------|----------------------------------|-----------------------------------------------|----------------------------|------------------|
| -<br>21158-5316                                           | FIN 329<br>9.7655   | 36.86<br>0.176   | 2003.19<br>112.8  | 0.054<br>160.2                   | 81.3<br>2018.400                              | 96.0 0.158<br>91.7 0.170   | TOKOVININ        |
| -<br>21208-4049                                           | HDS 3039<br>11.1322 | 32.34<br>0.265   | 2019.76<br>106.1  | 0.390<br>146.5                   | 200.7<br>2019.378                             | 28.6 0.145<br>20.6 0.168   | TOKOVININ        |
| 15215<br>21410+2920                                       | STT 448<br>1.4742   | 244.2<br>0.482   | 2017.12<br>133.0  | 0.699<br>336.7                   | 36.3<br>2008.67                               | 30.3 0.154<br>23.4 0.158   | ALZNER           |
| -<br>21533-4650                                           | FIN 374<br>12.4267  | 28.97<br>0.089   | 2005.20<br>97.6   | 0.800<br>26.0                    | 132.2<br>2019.529                             | 308.4 0.144<br>308.0 0.140 | TOKOVININ        |
| -<br>22124-1412                                           | HDS 3152<br>3.4340  | 104.8<br>0.528   | 2034.9<br>77.5    | 0.160<br>152.5                   | 257.3<br>2019.539                             | 327.7 0.111<br>345.8 0.104 | TOKOVININ        |
| -<br>22234-4324                                           | HDS 3173<br>4.3902  | 82.0<br>0.171    | 2016.32<br>142.7  | 0.327<br>189.0                   | 196.7<br>2019.539                             | 341.2 0.110<br>333.1 0.108 | TOKOVININ        |
| -<br>22266-1645                                           | SHJ 345AB<br>0.1800 | 2000.0<br>10.330 | 2021.21<br>37.1   | 0.878<br>162.9                   | 288.4<br>2019.539                             | 88.8 1.226<br>93.7 1.238   | TOKOVININ        |
| -<br>22441+0644                                           | TOK 703<br>71.7240  | 5.019<br>0.059   | 2015.926<br>134.3 | 0.316<br>166.5                   | 168.7<br>2019.949                             | 115.9 0.044<br>352.6 0.040 | TOKOVININ        |
| 16428<br>22592+1144                                       | STT 483<br>1.4157   | 254.3<br>0.709   | 2024.27<br>27.5   | 0.355<br>7.2                     | 34.5<br>2016.658                              | 28.9 0.460<br>31.7 0.459   | ALZNER           |

- (1) ALZNER, ARGYLE & HORCH
- (2) SCARDIA, PRIEUR, PANSECCHI, LING, ARGYLE, ARISTIDI, ZANUTTA, MACCARINI, ABE, BENDJOYA, RIVET, SUAREZ & VERNET
- (3) DOCOBO, MÉNDEZ, CAMPO, COSTA & GÓMEZ
- (4) LING, SCARDIA, PRIEUR, PANSECCHI, ARGYLE, ARISTIDI, ZANUTTA, MACCARINI, ABE, BENDJOYA, RIVET, SUAREZ & VERNET



## NEW DOUBLE STARS

Discovered by: Marco Scardia using the speckle camera PISCO attached to the Epsilon telescope of the Calern Observatory

| STAR          | Coord. FK5 J2000        | Mag.        | Epoch    | $\theta$<br>( $^{\circ}$ ) | $\rho$<br>( $''$ ) | Notes          |
|---------------|-------------------------|-------------|----------|----------------------------|--------------------|----------------|
| SCA 193 Aa,Ab | 13 05 00.78 +13 04 09.7 | 11.1 - 11.4 | 2020.215 | 341.2                      | 0.30               | AB is J 2103   |
| SCA 194 AC    | 11 16 07.34 +01 35 12.1 | 9.0 - 11.6  | 2020.256 | 178.9                      | 2.824              | AB is STF 1522 |
| SCA 194 BC    | 11 16 07.34 +01 35 12.1 | 11.0 - 11.6 | 2020.256 | 204.0                      | 0.431              |                |
| SCA 195 Aa,Ab | 14 12 43.27 +25 46 52.9 | 11.3 - 11.7 | 2020.259 | 230.4                      | 0.16               | AB is COU 480  |
| SCA 196 AC    | 11 07 43.26 +52 17 05.8 | 11.9 - 13.5 | 2020.278 | 76.0                       | 3.12               | AB is DAM 1440 |
| SCA 196 BC    | 11 07 43.26 +52 17 05.8 | 12.1 - 13.5 | 2020.278 | 80.4                       | 1.0                |                |
| SCA 197 AC    | 14 14 50.85 +10 06 02.2 | 5.4 - 10.0  | 2020.311 | 109.5                      | 1.042              | AB is KUI 66   |
| SCA 197 BC    | 14 14 50.85 +10 06 02.2 | 8.4 - 10.0  | 2020.311 | 134.7                      | 0.17               |                |
| SCA 198 AC    | 15 12 39.40 +34 39 35.2 | 10.3 - 13.0 | 2020.376 | 107.8                      | 6.290              | AB is TDS 9446 |
| SCA 199 Aa,Ab | 17 24 57.72 +01 07 35.9 | 11.0 - 11.0 | 2020.399 | 158.8                      | 0.16               | AB is RST 5431 |

### NOTE

Precise identification

Marco Scardia and Luca Maccarini identified the pair, COU 2552, whose precise coordinates are missing in the WDS, along with the star, TYC 3290-1518-1 (01 30 35.88 +51 32 27.0 Eq. 2000). An observation made at Calern observatory using the Epsilon+PISCO telescope on January 11, 2020, confirmed the identification.

Marco Scardia

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The deadline for contributions to Information Circular No. 202 is:

October 15th 2020

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