***Tectonophysics***

Supporting Information for

**New paleomagnetic results for Ordovician and Silurian rocks of the Tarim Block, Northwest China and their paleogeographic implications**

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**Contents of this file**

Figure S1, S2 and Table S1, S2 and S3

**Introduction**

The auxiliary material contains 2 figure and 3 table files for the studied Ordovician and Silurian rocks in the northwestern Tarim basin described in the manuscript.

1. Figure S1: Equal-area projections of low temperature component isolated from 165 Llandovery and Wenlock specimens (a) *in-situ* and (b) after tilt correction from the Aksu Sishichang and Kalpin Subhash sections of northwestern Tarim.
2. Figure S2: Equal-area projections of site-mean directions of the characteristic component A isolated from Ordovician rocks in the Aksu-Kalpin-Bachu areas, northwestern Tarim (a) *in-situ* and (b) after the tilt correction.
3. Table S1: Summary of Ordovician paleomagnetic results for characteristic A component from the Aksu-Kalpin-Bachu areas of northwestern Tarim.
4. Table S2: List of isolated characteristic remanent magnetizations from the Ordovician specimens, Aksu and Kalpin areas of NW Tarim, China.
5. Table S3: List of isolated characteristic remanent magnetizations from the Silurian specimens, Aksu and Kalpin areas of NW Tarim, China.

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**Supplementary Figure S1:** Equal-area projections of low temperature component isolated from 165 Llandovery and Wenlock specimens (a) *in-situ* and (b) after tilt correction from the Aksu Sishichang and Kalpin Subhash sections of northwestern Tarim. The stars are Fisherian (Fisher, 1953) group-mean directions and solid and open symbols record directions plotted onto lower and upper hemispheres, respectively.



**Supplementary Figure S2:** Equal-area projections of site-mean directions of the characteristic component A isolated from Ordovician rocks in the Aksu-Kalpin-Bachu areas, northwestern Tarim (a) *in-situ* and (b) after the tilt correction. Stars show group mean directions with solid and open symbols recording directions plotted onto the lower and upper hemispheres, respectively. See Supplementary Table S1 for directions of this plot. Redrawn from Sun and Huang (2009).

**Supplementary Table S1:** Summary of Ordovician paleomagnetic results for characteristic A component from the Aksu-Kalpin-Bachu areas of northwestern Tarim.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Site ID** | **Lithology** | **Location** | | **Bedding** | **n/n0** | **R/N** | **In-situ** | | **Tilt-corrected** | | ***k*** | **α95(**°**)** | **VGP** | |
| **φs(**°E**)** | **λs(**°N**)** | **Strike/dip** | **Dg(**°**)** | **Ig(**°**)** | **Ds(**°**)** | **Is(**°**)** | **φp(**°E**)** | **λp(**°N**)** |
| as16 | Argillaceous limestone | 79.8341 | 40.8399 | 81/60 | 9/10 | 9/0 | 176.7 | -60.8 | 345.6 | -58.9 | 338.8 | 2.8 | 192.4 | -87.3 |
| as17 | Sandy limestone | 79.8344 | 40.8398 | 78/70 | 6/10 | 6/0 | 172.4 | -35.2 | 336.0 | -74.1 | 39.4 | 10.8 | 99.0 | -67.6 |
| as18 | Sandy limestone | 79.8344 | 40.8398 | 77/66 | 5/10 | 5/0 | 165.4 | -62.9 | 349.2 | -50.6 | 78.3 | 8.7 | 192.7 | -78.7 |
| as19 | Sandy limestone | 79.8344 | 40.8397 | 78/52 | 7(1)/10 | 2/5 | 3.7 | 70.2 | 158.5 | 56.7 | 64.0 | 7.6 | 89.0 | 76.4 |
| as20 | Sandy limestone | 79.8345 | 40.8396 | 79/61 | 7(3)/10 | 7/0 | 172.0 | -60.3 | 346.1 | -58.6 | 125.9 | 5.4 | 176.2 | -84.0 |
| as21 | Sandy limestone | 79.8345 | 40.8396 | 77/61 | 10(2)/11 | 10/0 | 170.1 | -60.4 | 344.1 | -58.5 | 98.1 | 4.9 | 177.0 | -82.5 |
| as22 | Sandy limestone | 79.8345 | 40.8396 | 81/66 | 4(2)/10 | 4/0 | 186.2 | -65.0 | 341.5 | -47.8 | 220.5 | 6.2 | 293.7 | -82.4 |
| as23 | Sandy limestone | 79.8345 | 40.8396 | 79/51 | 8/10 | 7/1 | 172.4 | -58.0 | 343.4 | -70.9 | 95.4 | 5.7 | 151.9 | -83.8 |
| as24 | Sandy marl | 79.8344 | 40.8394 | 70/66 | 11/12 | 11/0 | 187.0 | -66.0 | 325.0 | -44.7 | 91.4 | 4.8 | 291.1 | -81.0 |
| as25 | Silty mudstone | 79.8344 | 40.8394 | 72/63 | 8/10 | 5/3 | 180.7 | -61.7 | 328.0 | -53.2 | 134.1 | 4.8 | 273.9 | -87.9 |
| as26 | Limestone, siltstone | 79.8341 | 40.8393 | 67/68 | 10/11 | 10/0 | 163.7 | -61.7 | 332.6 | -50.0 | 36.5 | 8.1 | 184.8 | -77.7 |
| as27 | Limestone, siltstone | 79.8341 | 40.8391 | 70/72 | 4(1)/10 | 1/3 | 37.4 | 59.9 | 130.2 | 31.6 | 42.2 | 14.3 | 157.5 | 61.9 |
| as28 | Limestone, mudstone | 79.8341 | 40.8390 | 78/71 | 8(1)/10 | 1/7 | 7.7 | 63.1 | 155.8 | 43.9 | 454.5 | 2.6 | 133.8 | 83.2 |
| as29 | Limestone, mudstone | 79.8341 | 40.8390 | 77/70 | 9/10 | 1/8 | 6.3 | 60.4 | 153.0 | 47.4 | 424.8 | 2.5 | 161.6 | 85.2 |
| as30 | Marl, mudstone | 79.8342 | 40.8389 | 77/74 | 9/10 | 4/5 | 6.2 | 63.8 | 156.0 | 40.4 | 137.8 | 4.4 | 122.1 | 83.5 |
| as31 | Marl | 79.8342 | 40.8389 | 73/66 | 8/10 | 3/5 | 1.8 | 62.3 | 149.5 | 50.1 | 251.3 | 3.5 | 105.0 | 86.9 |
| as32 | Limestone, mudstone | 79.8342 | 40.8388 | 77/75 | 9/11 | 3/6 | 11.9 | 63.2 | 152.1 | 39.1 | 58.3 | 6.8 | 142.0 | 80.5 |
| as33 | Limestone, mudstone | 79.8343 | 40.8388 | 75/73 | 7/10 | 4/3 | 185.2 | -59.7 | 330.7 | -44.9 | 335.4 | 3.3 | 352.3 | -86.0 |
| as34 | Limestone, siltstone | 79.8344 | 40.8388 | 73/75 | 8/10 | 2/6 | 356.3 | 60.6 | 154.0 | 43.3 | 83.4 | 6.1 | 6.0 | 87.1 |
| aq56 | Medium-bedded limestone | 79.9431 | 40.9133 | 56/37 | 0/7 | NRM intensity very weak before or after 1-3 steps demagnetizations | | | | | | | | |
| aq57 | Medium-bedded limestone | 79.9431 | 40.9133 | 48/37 | 0/8 |
| aq58 | Thick-bedded limestone | 79.9461 | 40.9156 | 62/31 | 0/8 |
| aq59 | Thick-bedded limestone | 79.9467 | 40.9153 | 37/31 | 0/6 |
| aq60 | Thick-bedded limestone | 79.9471 | 40.9153 | 34/26 | 0/9 |
| aq61 | Thick-bedded limestone | 79.9473 | 40.9152 | 33/30 | 0/8 |
| ks88 | Nodular limestone | 78.9198 | 40.5584 | 231/44 | 0/9 | No stable site-mean direction could be isolated | | | | | | | | |
| ks90 | Marl, mudstone | 78.9208 | 40.5581 | 233/39 | 8(8)/9 | 0/8 | 353.7 | 66.4 | 336.6 | 29.7 | 126.2 | 4.6 | 52.7 | 80.6 |
| ks91 | Sandy limestone | 78.9218 | 40.5587 | 239/42 | 7(7)/11 | 0/7 | 1.8 | 68.6 | 342.1 | 29.2 | 267.0 | 3.7 | 84.5 | 78.6 |
| ks93 | Siltstone | 78.9248 | 40.5584 | 240/38 | 0/8 | No stable site-mean could be isolated | | | | | | | | |
| ks94 | Dolomitic limestone | 78.9351 | 40.5615 | 216/30 | 8(1)/9 | 1/7 | 9.3 | 61.3 | 340.4 | 40.7 | 110.2 | 5.3 | 151.1 | 82.8 |
| ks95  ks96 | Dolomitic limestone  Medium-bedded limestone | 78.9351  78.9350 | 40.5611  40.5610 | 216/30  214/30 | 10(7)/19 | 2/8 | 197.6 | -60.6 | 165.0 | -42.8 | 41.4 | 7.6 | 338.8 | -76.7 |
| ks97 | Medium-bedded limestone | 78.9351 | 40.5719 | 215/30 | 0/8 | NRM intensity very weak before or after only 1-3 steps demagnetization | | | | | | | | |
| ks98 | Medium-bedded limestone | 78.9363 | 40.5611 | 216/28 | 0/9 |
| ks99 | Medium-bedded limestone | 78.9366 | 40.5611 | 216/28 | 0/5 | No stable site-mean could be isolated | | | | | | | | |
| xk207 | Nodular limestone | 78.9219 | 40.5550 | 238.6/34 | 8(1)/9 | 0/8 | 330.0 | 33.2 | 330.0 | -0.8 | 47.7 | 8.1 | 316.8 | 55.8 |
| by111 | Marl | 78.8398 | 40.0889 | 182/19 | 8/10 | 0/8 | 346.2 | 77.5 | 301.2 | 64.7 | 43.4 | 8.5 | 66.6 | 62.9 |
| by112 | Marl | 78.8398 | 40.0890 | 189/11 | 8/9 | 0/8 | 325.5 | 71.4 | 309.3 | 62.6 | 192.6 | 4.0 | 35.8 | 62.4 |
| by113 | Limestone | 78.8397 | 40.0891 | 192/20 | 8/9 | 0/8 | 60.1 | 58.6 | 23.8 | 69.2 | 55.5 | 7.5 | 149.4 | 44.7 |
| by114 | Limestone | 78.8396 | 40.0893 | 193/19 | 7/9 | 0/7 | 53.7 | 55.7 | 23.5 | 64.2 | 379.9 | 3.1 | 156.3 | 48.2 |
| by116 | Limestone | 78.8203 | 40.1509 | 339/16 | 9/11 | 9/0 | 201.1 | -64.9 | 217.9 | -52.4 | 917.1 | 1.7 | 318.1 | -73.4 |
| by117 | Massive limestone | 78.8205 | 40.1510 | 325/16 | 7(2)/18 | 7/0 | 201.9 | -59.1 | 211.6 | -45.0 | 60.8 | 7.8 | 342.7 | -73.3 |
| by118 | Limestone | 78.8206 | 40.1511 |
| **Formation mean** | | | | | 14/30 | 14/0 | 180.3 | -60.3 |  |  | 69.5 | 4.8 |  | |
|  |  | 323.2 | -66.8 | 6.9 | 16.3 |
| 16/30 | 0/16 | 7.5 | 64.8 |  |  | 28.0 | 7.1 |  | |
|  |  | 114.9 | 84.2 | 2.9 | 26.6 |
| 30/30 | 14/16 | 3.8 | 62.7 |  |  | 38.7 | 4.3 | 113.3 | 84.8 |
|  |  | 138.0 | 75.3 | 3.9 | 15.3 | *K*=22.2, *A*95=5.7 | |
| **Fold test:**  (1) Watson and Enkin’s test (1993): the optimum concentration is achieved at 3.9 ± 1.8% unfolding;  (2) McFadden’s test (1990): N = 30, *in-situ* *ξ*2 = 5.634, tilt-corrected *ξ*2 = 28.522, statistical threshold *ξ* = 6.371 at 95% confidence level, indicative of a negative fold test. | | | | | | | | | | | | | | |

Note. All the site mean directions but that for site xk207 are from Sun and Huang (2009). Abbreviations are: site ID, site identification; Strike/dip, strike azimuth and dip of bed; n/n0, number of samples used in mean calculation/demagnetized, number in parentheses indicates number of remagnetization circles used; R/N, samples showing reversed/normal polarity; Dg, Ig (Ds, Is), declination and inclination of direction *in-situ* (after tilt-correction); λs, φs, latitude and longitude of the sampling site; λp, φp, latitude and longitude of corresponding virtual geomagnetic pole (VGP) in geographic coordinates.

**Supplementary Table S2:** List of isolated characteristic remanent magnetizations from the Ordovician specimens, Aksu and Kalpin areas of NW Tarim, China.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Speci. ID** | **Code** | **Step Range** | **N** | **Dg** | **Ig** | **Ds** | **Is** | **MAD** | **Comment** |
| as20-2 | DirOPCA | T350-585 | 5 | 145.7 | -10.6 | 114.5 | -61.5 | 7.3 | Comp. B |
| as20-4 | DirOPCA | T350-570 | 7 | 133.2 | 3.5 | 116.4 | -42.8 | 9.6 | Comp. B |
| as20-6 | DirOPCA | T350-525 | 5 | 141.6 | -13.3 | 104.9 | -60.1 | 8.5 | Comp. B |
| as22-7 | DirOPCA | T350-550 | 6 | 133.4 | 2.8 | 112.0 | -44.6 | 8.9 | Comp. B |
| as22-8 | DirOPCA | T350-550 | 6 | 137.4 | 8.1 | 121.3 | -44.1 | 12.1 | Comp. B |
| as22-9 | DirOPCA | T300-550 | 7 | 131.7 | 4.3 | 112.2 | -42.4 | 6.6 | Comp. B |
| as22-10 | DirOPCA | T350-550 | 6 | 149.0 | -8.0 | 114.6 | -63.5 | 7.1 | Comp. B |
| ks89-3 | GCnPCA | M80-15 | 7 | 260.5 | 5.9 | 78.3 | 11.9 | 7.3 | Comp. B |
| ks89-4 | GCnPCA | M80-12 | 6 | 263.1 | 5.1 | 79.9 | 14.2 | 4.7 | Comp. B |
| ks89-5 | GCnPCA | M80-20 | 9 | 262.1 | 4.0 | 78.3 | 14.3 | 11.0 | Comp. B |
| ks89-9 | GCnPCA | M80-20 | 8 | 263.8 | 11.9 | 84.7 | 9.2 | 10.9 | Comp. B |
| ks90-1 | GCnPCA | T156-M30 | 10 | 87.9 | 1.2 | 80.8 | 22.1 | 5.9 | Comp. B |
| ks90-3 | GCnPCA | T80-M25 | 10 | 109.3 | 13.5 | 94.8 | 43.7 | 6.5 | Comp. B |
| ks90-4 | DirOPCA | M16-40 | 6 | 19.8 | -67.7 | 105.9 | -58.2 | 10.8 | Comp. B |
| ks90-5 | DirOPCA | M20-50 | 7 | 35.4 | -75.2 | 119.1 | -53.1 | 10.5 | Comp. B |
| ks90-6 | GCnPCA | T80-M20 | 9 | 111.1 | 6.0 | 101.3 | 37.8 | 8.7 | Comp. B |
| ks90-7 | GCnPCA | T80-M25 | 9 | 107.6 | 14.5 | 92.1 | 43.7 | 8.6 | Comp. B |
| ks91-1 | GCnPCA | M80-20 | 9 | 118.2 | 15.8 | 100.3 | 49.0 | 8.0 | Comp. B |
| ks91-2 | DirOPCA | M10-45 | 8 | 8.1 | -67.9 | 118.5 | -62.1 | 9.0 | Comp. B |
| ks91-3 | DirOPCA | M15-40 | 5 | 14.5 | -78.1 | 134.0 | -55.5 | 10.3 | Comp. B |
| ks91-5 | DirOPCA | M20-60 | 10 | 335.1 | -67.7 | 142.2 | -70.0 | 5.6 | Comp. B |
| ks91-6 | DirOPCA | M20-60 | 8 | 350.4 | -73.3 | 135.6 | -63.0 | 3.7 | Comp. B |
| ks91-7 | DirOPCA | M20-60 | 9 | 348.9 | -72.1 | 135.1 | -64.2 | 10.1 | Comp. B |
| ks91-8 | DirOPCA | M20-55 | 8 | 22.3 | -73.7 | 125.5 | -55.7 | 6.9 | Comp. B |
| ks91-9 | DirOPCA | M20-65 | 10 | 10.3 | -85.6 | 144.4 | -51.2 | 8.4 | Comp. B |
| ks91-10 | DirOPCA | M20-60 | 9 | 3.7 | -66.4 | 117.2 | -64.3 | 10.5 | Comp. B |
| ks91-11 | DirOPCA | M15-60 | 7 | 317.0 | -72.2 | 157.7 | -65.2 | 5.0 | Comp. B |
| ks92-1 | GCnPCA | T100-M30 | 10 | 123.7 | 19.6 | 106.8 | 52.4 | 3.7 | Comp. B |
| ks92-2 | GCnPCA | T100-M30 | 9 | 120.4 | 13.9 | 106.5 | 45.9 | 3.4 | Comp. B |
| ks92-4 | DirOPCA | M20-60 | 8 | 64.5 | -53.3 | 102.2 | -36.4 | 4.7 | Comp. B |
| ks92-5 | DirOPCA | M15-55 | 9 | 59.3 | -47.0 | 93.6 | -35.0 | 6.0 | Comp. B |
| ks92-6 | DirOPCA | M15-55 | 9 | 63.6 | -53.3 | 101.8 | -36.8 | 8.3 | Comp. B |
| ks92-7 | DirOPCA | M15-55 | 9 | 50.5 | -50.2 | 92.4 | -41.5 | 5.0 | Comp. B |
| ks92-8 | DirOPCA | M20-60 | 9 | 58.6 | -55.9 | 102.4 | -40.7 | 8.4 | Comp. B |
| ks92-9 | DirOPCA | M20-55 | 7 | 46.0 | -56.4 | 98.1 | -47.0 | 7.6 | Comp. B |
| xk205-1 | DirOPCA | M20-80 | 6 | 45.0 | -35.9 | 74.0 | -38.0 | 2.9 | Comp. B\_Antipode |
| xk205-2 | DirOPCA | M20-80 | 6 | 42.0 | -40.9 | 77.0 | -43.3 | 5.3 | Comp. B\_Antipode |
| xk205-3 | DirOPCA | M20-80 | 6 | 40.0 | -43.6 | 79.0 | -45.7 | 1.8 | Comp. B\_Antipode |
| xk205-4 | DirOPCA | M20-80 | 7 | 40.0 | -49.8 | 86.0 | -49.4 | 2.9 | Comp. B\_Antipode |
| xk205-5 | DirOPCA | M20-80 | 7 | 42.0 | -49.2 | 87.0 | -47.9 | 3.7 | Comp. B\_Antipode |
| xk205-6 | DirOPCA | M20-60 | 5 | 36.0 | -49.9 | 84.0 | -52.0 | 8.0 | Comp. B\_Antipode |
| xk205-8 | DirOPCA | M20-80 | 4 | 41.0 | -43.0 | 79.0 | -44.8 | 3.6 | Comp. B\_Antipode |
| xk205-9 | DirOPCA | M20-70 | 5 | 46.0 | -48.4 | 88.0 | -45.2 | 5.3 | Comp. B\_Antipode |
| xk205-10 | DirOPCA | M20-80 | 6 | 45.0 | -43.4 | 81.0 | -43.2 | 3.6 | Comp. B\_Antipode |
| xk206-1 | DirOPCA | M20-80 | 7 | 39.0 | -61.8 | 104.0 | -54.7 | 5.3 | Comp. B\_Antipode |
| xk206-2 | DirOPCA | M20-80 | 7 | 32.0 | -55.1 | 91.0 | -55.9 | 5.5 | Comp. B\_Antipode |
| xk206-3 | DirOPCA | M20-70 | 6 | 32.0 | -57.0 | 94.0 | -56.7 | 4.6 | Comp. B\_Antipode |
| xk206-4 | DirOPCA | M20-70 | 6 | 31.0 | -53.2 | 87.0 | -55.8 | 3.3 | Comp. B\_Antipode |
| xk206-6 | DirOPCA | M20-80 | 7 | 23.0 | -62.8 | 103.0 | -62.5 | 5.1 | Comp. B\_Antipode |
| xk206-7 | DirOPCA | M20-60 | 5 | 16.0 | -49.3 | 72.0 | -63.2 | 6.2 | Comp. B\_Antipode |
| xk206-8 | GCnPCA | T250-M60 | 8 | 278.0 | -6.2 | 269.0 | -25.8 | 3.4 | Comp. B\_Antipode |
| xk206-9 | GCnPCA | T250-M60 | 8 | 266.0 | -11.7 | 254.0 | -23.2 | 7.5 | Comp. B\_Antipode |
| xk206-10 | DirOPCA | M20-80 | 6 | 14.0 | -41.1 | 56.0 | -59.7 | 6.9 | Comp. B\_Antipode |
| xk207-1 | DirOPCA | M20-50 | 4 | 313.3 | 25.7 | 314.8 | -7.3 | 8.8 | Comp. A |
| xk207-2 | DirOPCA | M10-40 | 4 | 353.1 | 29.5 | 349.8 | -1.9 | 3.2 | Comp. A |
| xk207-3 | DirOPCA | M10-40 | 4 | 339.1 | 36.9 | 337.0 | 3.3 | 3.9 | Comp. A |
| xk207-4 | DirOPCA | M20-40 | 3 | 321.4 | 30.8 | 322.4 | -3.0 | 6.3 | Comp. A |
| xk207-5 | GC PCA | T100-M20 | 7 | 147.6 | 58.8 | 339.6 | 87.2 | 5.0 | Comp. A |
| xk207-7 | DirOPCA | T250-M30 | 5 | 328.8 | 37.1 | 328.8 | 3.1 | 6.3 | Comp. A |
| xk207-8 | DirOPCA | T250-M40 | 6 | 334.7 | 38.9 | 333.4 | 5.0 | 6.3 | Comp. A |
| xk207-10 | DirOPCA | M20-60 | 4 | 324.1 | 31.5 | 324.8 | -2.5 | 4.8 | Comp. A |
| xk208-4 | GCnPCA | T100-M50 | 10 | 84.6 | 0.1 | 79.4 | 17.0 | 6.6 | Comp. B |
| xk208-5 | GCnPCA | T250-M30 | 5 | 69.4 | 20.8 | 53.4 | 24.7 | 3.8 | Comp. B |
| xk208-6 | GCnPCA | T100-M30 | 8 | 120.0 | 22.5 | 103.1 | 53.8 | 4.9 | Comp. B |
| xk208-7 | GCnPCA | T100-M40 | 9 | 109.6 | 14.9 | 95.1 | 42.5 | 7.0 | Comp. B |
| xk208-8 | GCnPCA | T100-M30 | 8 | 108.0 | 13.7 | 94.2 | 40.7 | 3.2 | Comp. B |
| xk209-4 | GCnPCA | T100-M30 | 8 | 103.2 | 10.8 | 92.3 | 33.2 | 7.0 | Comp. B |
| xk209-5 | GCnPCA | T100-M40 | 9 | 114.1 | 22.9 | 97.1 | 48.8 | 10.8 | Comp. B |
| xk209-7 | GCnPCA | T100-M30 | 8 | 79.7 | 2.4 | 74.9 | 14.1 | 4.0 | Comp. B |
| xk209-9 | GCnPCA | T150-M40 | 9 | 133.4 | 16.7 | 126.6 | 49.3 | 12.6 | Comp. B |
| xk209-10 | GCnPCA | T100-M40 | 9 | 127.5 | 20.4 | 116.6 | 51.4 | 5.8 | Comp. B |
| xk210-3 | GCnPCA | T100-M30 | 9 | 105.4 | 12.3 | 92.9 | 37.6 | 5.6 | Comp. B |
| xk210-4 | GCnPCA | T100-M40 | 9 | 111.2 | 14.2 | 98.2 | 41.9 | 7.9 | Comp. B |
| xk210-7 | DirOPCA | M20-M70 | 6 | 47.3 | -61.9 | 100.4 | -48.9 | 5.5 | Comp. B |
| xk210-8 | DirOPCA | M20-M50 | 4 | 71.8 | -59.7 | 107.7 | -38.0 | 8.0 | Comp. B |
| xk210-9 | DirOPCA | M20-M50 | 4 | 66.5 | -55.4 | 101.2 | -37.1 | 6.8 | Comp. B |
| xk210-10 | GCnPCA | T100-M40 | 9 | 115.3 | 16.1 | 102.0 | 45.4 | 8.8 | Comp. B |
| xk211-3 | GCnPCA | T150-M40 | 8 | 132.4 | 29.6 | 115.4 | 63.8 | 4.5 | Comp. B |
| xk212-11 | GCnPCA | T100-M40 | 9 | 96.2 | 0.0 | 90.5 | 21.1 | 4.1 | Comp. B |
| xk212-10 | GCnPCA | T100-M30 | 7 | 88.5 | 0.7 | 83.1 | 17.6 | 5.2 | Comp. B |
| xk212-1 | GCnPCA | T100-M20 | 7 | 124.8 | 18.3 | 112.1 | 49.8 | 9.1 | Comp. B |
| xk212-2 | GCnPCA | T100-M20 | 7 | 139.6 | 18.6 | 134.1 | 53.9 | 10.8 | Comp. B |
| xk212-3 | GCnPCA | T100-M50 | 10 | 135.3 | 22.4 | 125.7 | 56.9 | 10.2 | Comp. B |
| xk212-4 | GCnPCA | T100-M40 | 9 | 137.9 | 23.0 | 129.8 | 57.9 | 5.7 | Comp. B |
| xk212-5 | GCnPCA | T150-M40 | 8 | 132.5 | 16.9 | 123.7 | 50.9 | 5.9 | Comp. B |
| xk212-7 | GCnPCA | T100-M40 | 9 | 129.2 | 17.8 | 118.5 | 50.8 | 7.0 | Comp. B |
| xk212-8 | GCnPCA | T100-M40 | 9 | 79.2 | 6.0 | 72.0 | 16.8 | 7.2 | Comp. B |
| xk213-10 | DirOPCA | M10-50 | 5 | 74.0 | -55.2 | 106.0 | -34.1 | 4.2 | Comp. B\_Antipode |
| xk214-3 | GCnPCA | T100-M30 | 8 | 80.5 | 6.1 | 72.5 | 18.5 | 8.5 | Comp. B |
| xk214-4 | GCnPCA | T100-M20 | 7 | 134.2 | 22.2 | 124.0 | 57.5 | 7.9 | Comp. B |
| xk214-5 | GCnPCA | T100-M10 | 6 | 107.0 | 11.9 | 93.9 | 37.7 | 4.9 | Comp. B |
| xk214-6 | GCnPCA | T100-M60 | 7 | 118.1 | 13.5 | 105.8 | 44.1 | 3.1 | Comp. B |
| xk214-7 | GCnPCA | T100-M30 | 7 | 111.9 | 10.7 | 100.1 | 38.9 | 13.7 | Comp. B |
| xk214-8 | GCnPCA | T150-M40 | 7 | 107.0 | 14.3 | 92.4 | 39.8 | 10.7 | Comp. B |
| xk214-9 | GCnPCA | T100-M20 | 7 | 112.4 | 5.1 | 103.7 | 34.1 | 8.4 | Comp. B |
| xk215-4 | GCnPCA | T100-M10 | 6 | 125.3 | 4.3 | 118.3 | 40.0 | 9.4 | Comp. B |
| xk215-8 | GCnPCA | T100-M20 | 7 | 84.3 | 4.3 | 76.1 | 20.5 | 5.9 | Comp. B |
| xk216-8 | DirOPCA | M20-60 | 4 | 61.8 | -73.4 | 122.1 | -44.7 | 7.9 | Comp. B |
| xk216-9 | GCnPCA | T100-M50 | 10 | 110.2 | 11.3 | 95.4 | 42.2 | 8.5 | Comp. B |
| xk217-1 | DirOPCA | M20-60 | 4 | 59.7 | -79.0 | 124.5 | -50.2 | 7.2 | Comp. B |
| xk217-2 | DirOPCA | M20-70 | 6 | 23.8 | -74.5 | 115.4 | -57.6 | 10.1 | Comp. B |
| xk217-3 | DirOPCA | M20-60 | 5 | 33.0 | -65.2 | 99.5 | -53.6 | 9.4 | Comp. B |
| xk217-4 | DirOPCA | M20-70 | 4 | 36.0 | -67.8 | 104.1 | -53.2 | 7.5 | Comp. B |
| xk217-5 | DirOPCA | M20-60 | 5 | 78.1 | -69.5 | 117.2 | -40.9 | 10.8 | Comp. B |
| xk217-6 | DirOPCA | M20-70 | 5 | 314.8 | -75.9 | 145.8 | -66.9 | 7.8 | Comp. B |
| xk217-7 | GCnPCA | T100-M30 | 8 | 266.6 | 3.9 | 83.0 | 16.8 | 6.7 | Comp. B |
| xk217-8 | GCnPCA | T100-M20 | 7 | 86.0 | 2.2 | 79.0 | 21.7 | 9.3 | Comp. B |
| xk217-9 | DirOPCA | M20-50 | 4 | 35.5 | -70.5 | 108.6 | -53.9 | 3.5 | Comp. B |

Note. Abbreviations are: Speci. ID, specimen number; Code (DirOPCA, GCnPCA, GC PCA), principal component analysis (PCA) method (PCA direction through origin, PCA great circle normalized, PCA great circle) used for isolation of the ChRM; Step Range, demagnetization range (T and M indicate thermal and alternative field demagnetization, respectively) used for the isolation of the ChRM; N, number of demagnetization steps used for the isolation of the ChRM; Dg/Ig (Ds/Is), declination/inclination of the ChRM before (after) the tilt correction; MAD, maximum angle deviation of Kirschvink (1980).

**Supplementary Table S3:** List of isolated characteristic remanent magnetizations from the Silurian specimens, Aksu and Kalpin areas of NW Tarim, China.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Speci. ID** | **Code** | **Step Range** | **N** | **Dg** | **Ig** | **Ds** | **Is** | **MAD** | **Comment** |
| as35-1 | DirOPCA | T300-660 | 11 | 100.6 | 19.0 | 102.9 | -14.1 | 13.0 | Used |
| as35-2 | DirOPCA | T610-670 | 7 | 82.5 | 21.3 | 94.5 | 0.8 | 7.7 | Used |
| as35-4 | DirOPCA | T580-660 | 7 | 65.0 | 51.8 | 116.4 | 26.8 | 10.7 | Used |
| as35-6 | DirOPCA | T300-665 | 12 | 79.1 | 30.1 | 100.3 | 8.1 | 3.7 | Used |
| as35-7 | DirOPCA | T500-650 | 8 | 66.6 | 31.4 | 96.3 | 18.2 | 3.6 | Used |
| as35-8 | DirOPCA | T300-590 | 7 | 158.6 | 27.6 | 158.6 | -31.4 | 4.9 | No use |
| as35-9 | DirOPCA | T400-665 | 12 | 165.6 | -4.6 | 172.3 | -63.1 | 5.8 | No use |
| as35-10 | DirOPCA | T400-640 | 9 | 167.3 | 37.0 | 166.3 | -21.7 | 7.7 | No use |
| as36-2 | DirOPCA | T250-640 | 14 | 1.5 | 62.2 | 140.6 | 55.6 | 3.0 | No use |
| as36-4 | DirOPCA | T300-630 | 9 | 161.9 | 31.2 | 161.8 | -27.8 | 5.8 | Used |
| as36-5 | DirOPCA | T450-670 | 10 | 147.2 | 71.5 | 155.2 | 12.9 | 6.7 | Used |
| as36-6 | DirOPCA | T400-630 | 7 | 158.1 | 56.2 | 158.5 | -2.8 | 13.1 | Used |
| as36-9 | DirOPCA | T400-660 | 11 | 165.3 | 53.3 | 162.8 | -5.5 | 9.1 | Used |
| as36-10 | DirOPCA | T400-660 | 10 | 48.3 | 50.3 | 111.3 | 36.2 | 9.3 | No use |
| as37-1 | DirOPCA | T500-665 | 10 | 71.4 | 46.7 | 110.5 | 21.9 | 9.2 | Used |
| as37-2 | DirOPCA | T400-665 | 12 | 63.6 | 35.5 | 96.8 | 22.1 | 7.6 | Used |
| as37-4 | DirOPCA | T610-670 | 7 | 43.7 | 8.6 | 61.5 | 24.9 | 5.2 | Used |
| as37-5 | DirOPCA | T400-680 | 15 | 121.0 | 9.8 | 112.4 | -33.9 | 8.1 | No use |
| as37-6 | DirOPCA | T570-675 | 10 | 57.3 | -71.4 | 358.9 | -28.7 | 15.9 | Used-Antipode |
| as37-7 | DirOPCA | T400-660 | 11 | 190.6 | 78.8 | 164.6 | 24.4 | 16.9 | Used |
| as37-8 | DirOPCA | T300-630 | 9 | 111.1 | 80.4 | 150.2 | 27.2 | 3.4 | Used |
| as37-9 | DirOPCA | T300-660 | 15 | 105.4 | 53.0 | 129.1 | 8.3 | 4.9 | Used |
| as38-2 | DirOPCA | T450-670 | 12 | 346.2 | 73.0 | 151.3 | 50.6 | 15.3 | No use |
| as38-5 | DirOPCA | T500-660 | 10 | 201.4 | 44.7 | 186.4 | -1.2 | 6.4 | No use |
| as38-7 | DirOPCA | T500-660 | 9 | 220.9 | 38.2 | 201.6 | 4.0 | 9.3 | No use |
| as38-8 | DirOPCA | T570-650 | 6 | 13.4 | 14.3 | 45.0 | 51.0 | 9.1 | No use |
| as38-9 | DirOPCA | T550-680 | 13 | 49.0 | 35.1 | 89.7 | 31.3 | 12.0 | No use " |
| as39-1 | DirOPCA | T450-640 | 7 | 339.1 | 80.2 | 155.2 | 45.8 | 8.7 | Used |
| as39-2 | DirOPCA | T450-630 | 7 | 62.8 | 78.9 | 142.3 | 35.8 | 8.1 | Used |
| as39-3 | DirOPCA | T200-540 | 6 | 72.1 | 61.0 | 122.8 | 28.2 | 10.7 | Used |
| as39-4 | GC PCA | T400-660 | 11 | 333.0 | 4.8 | 330.2 | 58.6 | 6.3 | Used |
| as39-5 | DirOPCA | T400-650 | 10 | 60.5 | 62.2 | 122.0 | 33.8 | 8.9 | Used |
| as39-8 | GC PCA | T400-670 | 13 | 185.6 | 9.5 | 13.4 | 36.7 | 14.3 | Used |
| as39-9 | DirOPCA | T400-650 | 12 | 47.7 | 72.7 | 134.5 | 39.5 | 15.8 | Used |
| as40-1 | DirOPCA | T300-590 | 7 | 84.9 | 67.7 | 134.1 | 30.1 | 11.8 | No use |
| as40-2 | DirOPCA | T300-630 | 9 | 81.5 | 70.0 | 135.7 | 32.3 | 4.6 | No use |
| as40-3 | GC PCA | T300-675 | 15 | 274.3 | 40.8 | 225.1 | 41.5 | 9.6 | Used-Antipode |
| as40-4 | DirOPCA | T660-680 | 5 | 218.5 | -32.1 | 260.0 | -42.0 | 9.2 | Used-Antipode |
| as40-5 | DirOPCA | T650-670 | 4 | 223.0 | -37.5 | 268.6 | -40.8 | 7.8 | Used-Antipode |
| as40-6 | GC PCA | T400-660 | 12 | 281.9 | 38.9 | 230.3 | 46.4 | 10.6 | Used-Antipode |
| as40-7 | DirOPCA | T650-675 | 5 | 235.4 | -16.0 | 253.4 | -20.4 | 11.0 | Used-Antipode |
| as40-8 | GC PCA | T350-650 | 13 | 309.7 | 30.8 | 259.0 | 64.7 | 9.6 | Used-Antipode |
| ks83-1 | DirOPCA | T450-670 | 11 | 63.2 | -13.3 | 64.9 | 8.8 | 7.5 | Used |
| ks83-2 | DirOPCA | T450-670 | 11 | 75.3 | -13.9 | 74.8 | 15.4 | 4.9 | Used |
| ks83-3 | DirOPCA | T450-665 | 10 | 55.3 | -23.8 | 66.0 | -4.1 | 6.3 | Used |
| ks83-4 | DirOPCA | T450-675 | 12 | 57.7 | -15.7 | 62.4 | 3.5 | 3.4 | Used |
| ks83-5 | DirOPCA | T540-680 | 11 | 60.6 | -14.7 | 63.9 | 6.1 | 4.9 | Used |
| ks83-6 | DirOPCA | T500-675 | 11 | 72.8 | -14.1 | 72.9 | 13.8 | 3.4 | Used |
| ks83-7 | DirOPCA | T540-650 | 6 | 55.5 | -9.1 | 56.3 | 7.0 | 1.7 | Used |
| ks83-8 | DirOPCA | T500-660 | 8 | 54.1 | -1.8 | 50.3 | 11.4 | 4.5 | Used |
| ks83-10 | DirOPCA | T450-670 | 14 | 73.5 | -8.3 | 69.9 | 18.9 | 2.6 | Used |
| ks84-1 | DirOPCA | T500-675 | 11 | 69.5 | -21.8 | 74.9 | 5.7 | 5.5 | Used |
| ks84-2 | DirOPCA | T450-675 | 12 | 74.0 | -14.9 | 74.3 | 13.8 | 3.3 | Used |
| ks84-3 | DirOPCA | T500-680 | 12 | 71.8 | -22.2 | 76.9 | 6.7 | 3.4 | Used |
| ks84-4 | DirOPCA | T500-675 | 11 | 71.1 | -24.3 | 77.6 | 4.5 | 4.1 | Used |
| ks84-5 | DirOPCA | T500-680 | 12 | 61.9 | -15.0 | 65.0 | 6.6 | 4.8 | Used |
| ks84-6 | DirOPCA | T500-680 | 12 | 70.0 | -16.7 | 72.3 | 10.1 | 3.9 | Used |
| ks84-7 | DirOPCA | T540-675 | 7 | 70.8 | -13.1 | 70.7 | 13.5 | 3.2 | Used |
| ks84-8 | DirOPCA | T500-680 | 9 | 70.8 | -22.4 | 76.2 | 5.9 | 4.2 | Used |
| ks84-9 | DirOPCA | T500-665 | 12 | 72.6 | -20.4 | 76.5 | 8.6 | 4.5 | Used |
| ks85-1 | DirOPCA | T540-680 | 10 | 81.4 | -18.1 | 83.3 | 11.2 | 8.6 | Used |
| ks85-3 | DirOPCA | T500-680 | 10 | 88.5 | 1.9 | 79.4 | 32.1 | 6.9 | Used |
| ks85-4 | DirOPCA | T400-660 | 10 | 78.6 | -4.7 | 73.7 | 21.3 | 3.8 | Used |
| ks85-5 | DirOPCA | T590-660 | 5 | 80.8 | -4.2 | 75.4 | 22.9 | 2.1 | Used |
| ks85-6 | DirOPCA | T500-670 | 9 | 81.6 | -7.0 | 77.7 | 20.9 | 6.0 | Used |
| ks85-7 | DirOPCA | T540-660 | 7 | 77.4 | -0.9 | 70.3 | 23.9 | 4.4 | Used |
| ks85-8 | DirOPCA | T590-680 | 9 | 72.8 | -0.8 | 66.2 | 21.4 | 3.9 | Used |
| ks85-9 | DirOPCA | T350-675 | 16 | 69.4 | -15.8 | 72.1 | 7.1 | 2.3 | Used |
| ks86-1 | DirOPCA | T590-670 | 6 | 84.2 | -4.4 | 78.7 | 24.5 | 6.8 | Used |
| ks86-2 | DirOPCA | T570-670 | 8 | 66.4 | -6.8 | 64.4 | 12.8 | 7.9 | Used |
| ks86-3 | DirOPCA | T540-670 | 9 | 75.6 | 6.1 | 64.3 | 28.6 | 6.1 | Used |
| ks86-4 | DirOPCA | T570-665 | 7 | 80.1 | 4.4 | 69.6 | 29.8 | 6.4 | Used |
| ks86-5 | DirOPCA | T610-675 | 7 | 72.4 | -6.2 | 69.1 | 16.7 | 12.2 | Used |
| ks86-6 | DirOPCA | T500-665 | 9 | 70.6 | 0.6 | 63.4 | 21.2 | 9.1 | Used |
| ks86-7 | DirOPCA | T500-650 | 7 | 69.0 | 8.9 | 56.4 | 26.7 | 4.0 | Used |
| ks86-8 | DirOPCA | T570-680 | 8 | 64.8 | 44.8 | 18.8 | 47.9 | 9.1 | No use |
| ks86-9 | DirOPCA | T580-670 | 9 | 36.9 | -22.0 | 52.1 | -17.1 | 5.7 | No use |
| ks87-1 | DirOPCA | T570-670 | 8 | 79.2 | -1.2 | 71.7 | 24.0 | 6.8 | Used |
| ks87-2 | DirOPCA | T540-660 | 7 | 64.4 | -3.3 | 60.8 | 13.2 | 7.1 | Used |
| ks87-3 | DirOPCA | T570-650 | 5 | 73.3 | -20.4 | 78.3 | 4.9 | 4.3 | Used |
| ks87-4 | DirOPCA | T540-670 | 9 | 54.1 | 4.5 | 47.6 | 12.2 | 5.3 | No use |
| ks87-5 | DirOPCA | T540-675 | 9 | 71.0 | -3.0 | 65.9 | 17.6 | 5.6 | Used |
| ks87-6 | DirOPCA | T570-680 | 7 | 87.7 | 17.6 | 65.8 | 44.0 | 6.5 | No use |
| ks87-7 | DirOPCA | T540-665 | 8 | 59.5 | -11.5 | 62.4 | 3.8 | 6.6 | Used |
| ks87-8 | DirOPCA | T570-675 | 7 | 71.6 | -17.0 | 75.0 | 6.8 | 7.3 | Used |
| ks87-9 | DirOPCA | T570-675 | 10 | 77.5 | -11.9 | 76.8 | 14.2 | 7.8 | Used |
| as41-1 | DirOPCA | T300-630 | 8 | 47.9 | 67.4 | 131.1 | 37.0 | 4.5 | Used |
| as41-2 | DirOPCA | T300-650 | 11 | 41.8 | 59.9 | 121.9 | 40.2 | 3.6 | Used |
| as41-3 | DirOPCA | T300-665 | 13 | 68.2 | 59.4 | 123.1 | 27.0 | 6.6 | Used |
| as41-4 | DirOPCA | T300-660 | 12 | 62.9 | 51.9 | 114.1 | 27.6 | 4.9 | Used |
| as41-5 | DirOPCA | T300-670 | 13 | 79.4 | 64.2 | 130.2 | 23.8 | 6.1 | Used |
| as41-6 | DirOPCA | T300-570 | 6 | 90.0 | 45.2 | 116.6 | 8.8 | 5.5 | Used |
| as41-7 | DirOPCA | T450-630 | 5 | 75.3 | 29.6 | 97.0 | 9.7 | 7.1 | Used |
| as41-8 | DirOPCA | T250-665 | 15 | 57.9 | 48.0 | 108.8 | 29.6 | 5.6 | Used |
| as41-9 | DirOPCA | T350-665 | 13 | 73.2 | 39.1 | 104.5 | 15.9 | 8.7 | Use |
| as42-1 | DirOPCA | T450-670 | 11 | 58.7 | 33.9 | 95.3 | 22.8 | 6.9 | Used |
| as42-2 | DirOPCA | T540-675 | 10 | 42.2 | 15.0 | 69.5 | 29.5 | 8.4 | Used |
| as42-3 | DirOPCA | T450-665 | 10 | 60.9 | 45.1 | 107.5 | 24.8 | 4.9 | Used |
| as42-4 | DirOPCA | T400-660 | 10 | 45.0 | 55.4 | 117.5 | 36.4 | 3.7 | Used |
| as42-5 | DirOPCA | T350-650 | 11 | 58.1 | 40.7 | 102.2 | 25.4 | 5.3 | Used |
| as42-6 | DirOPCA | T350-650 | 11 | 61.0 | 43.8 | 106.1 | 24.4 | 4.4 | Used |
| as42-9 | DirOPCA | T350-650 | 11 | 76.3 | 33.6 | 101.3 | 9.4 | 7.1 | Used |
| as42-10 | DirOPCA | T350-650 | 11 | 61.4 | 30.3 | 92.6 | 19.3 | 7.2 | Used |
| as42-12 | DirOPCA | T350-680 | 16 | 49.6 | 35.5 | 94.4 | 30.4 | 11.9 | Used |
| as43-2 | DirOPCA | T300-590 | 9 | 52.6 | 48.3 | 109.5 | 31.1 | 5.9 | Used |
| as43-4 | DirOPCA | T300-570 | 8 | 30.6 | 48.4 | 109.0 | 45.7 | 8.6 | Used |
| as43-5 | DirOPCA | T250-590 | 10 | 54.2 | 58.5 | 121.5 | 31.5 | 3.1 | Used |
| as43-6 | GC PCA | T300-590 | 9 | 291.2 | 17.7 | 252.1 | 45.9 | 10.9 | Used |
| as43-7 | GC PCA | T250-590 | 10 | 191.4 | 19.1 | 15.9 | 32.1 | 17.4 | Used |
| as43-8 | GC PCA | T200-610 | 13 | 296.3 | 21.2 | 250.0 | 51.7 | 10.4 | Used |
| as44-1 | DirOPCA | T300-650 | 12 | 57.8 | 44.1 | 102.4 | 29.5 | 3.0 | Used |
| as44-2 | DirOPCA | T350-610 | 9 | 62.5 | 49.5 | 109.6 | 28.5 | 4.8 | Used |
| as44-3 | DirOPCA | T300-610 | 10 | 62.8 | 50.8 | 111.0 | 28.9 | 3.8 | Used |
| as44-4 | DirOPCA | T350-630 | 10 | 62.3 | 50.8 | 110.8 | 29.1 | 4.3 | Used |
| as44-5 | DirOPCA | T300-630 | 11 | 69.9 | 39.1 | 101.8 | 19.2 | 3.7 | Used |
| as44-6 | DirOPCA | T350-610 | 9 | 46.7 | 35.9 | 89.8 | 34.5 | 9.6 | Used |
| as44-7 | DirOPCA | T350-650 | 11 | 63.5 | 46.0 | 106.2 | 26.5 | 6.9 | Used |
| as44-8 | DirOPCA | T250-590 | 11 | 51.2 | 40.2 | 96.1 | 32.7 | 6.1 | Used |
| ks77-1 | DirOPCA | T400-630 | 8 | 275.0 | -15.2 | 261.0 | -32.1 | 10.8 | Used-Antipode |
| ks77-2 | DirOPCA | T400-590 | 6 | 299.7 | -14.9 | 287.8 | -43.6 | 9.7 | No use |
| ks77-3 | DirOPCA | T500-665 | 9 | 271.7 | -13.5 | 258.9 | -29.0 | 4.4 | Used-Antipode |
| ks77-4 | DirOPCA | T450-670 | 11 | 249.5 | -43.8 | 217.2 | -39.5 | 5.2 | No use |
| ks77-5 | DirOPCA | T540-670 | 9 | 271.2 | -10.6 | 260.3 | -26.3 | 4.9 | Used-Antipode |
| ks77-6 | DirOPCA | T450-670 | 11 | 306.5 | -23.5 | 291.5 | -54.0 | 6.9 | No use |
| ks77-7 | DirOPCA | T400-660 | 10 | 274.8 | -24.7 | 253.9 | -39.8 | 6.2 | Used-Antipode |
| ks77-8 | DirOPCA | T400-650 | 9 | 295.3 | -37.5 | 262.3 | -60.8 | 7.7 | No use |
| ks77-9 | DirOPCA | T400-660 | 12 | 303.1 | -28.8 | 282.6 | -57.4 | 7.2 | No use |
| ks78-4 | DirOPCA | T400-675 | 11 | 297.4 | -25.3 | 283.8 | -51.9 | 17.3 | No use |
| ks78-5 | DirOPCA | T450-660 | 9 | 340.8 | 64.0 | 332.3 | 33.7 | 8.0 | No use |
| ks78-6 | DirOPCA | T500-670 | 10 | 266.2 | 15.7 | 269.3 | -2.3 | 8.7 | Used-Antipode |
| ks78-7 | DirOPCA | T450-665 | 10 | 278.0 | 12.2 | 278.4 | -10.1 | 9.9 | Used-Antipode |
| ks78-8 | DirOPCA | T500-650 | 11 | 327.7 | 2.5 | 328.3 | -28.3 | 8.5 | Used-Antipode |
| ks78-9 | DirOPCA | T400-590 | 8 | 296.5 | -25.4 | 282.5 | -51.6 | 11.5 | Used-Antipode |
| ks78-10 | DirOPCA | T400-630 | 8 | 270.6 | -35.9 | 243.7 | -49.2 | 6.3 | Used-Antipode |
| ks79-1 | DirOPCA | T450-680 | 12 | 301.3 | -3.9 | 296.9 | -38.3 | 3.5 | No use |
| ks79-3 | DirOPCA | T450-675 | 12 | 279.2 | 1.4 | 273.9 | -26.4 | 3.4 | Used-Antipode |
| ks79-5 | DirOPCA | T540-680 | 11 | 252.5 | -32.5 | 225.3 | -40.4 | 4.8 | No use |
| ks79-6 | DirOPCA | T590-680 | 8 | 282.5 | -32.8 | 253.9 | -57.8 | 3.9 | No use |
| ks79-7 | DirOPCA | T570-675 | 9 | 268.4 | -12.5 | 255.3 | -33.7 | 4.4 | Used-Antipode |
| ks79-8 | DirOPCA | T500-675 | 10 | 281.3 | -15.5 | 267.3 | -42.6 | 5.5 | Used-Antipode |
| ks79-10 | DirOPCA | T580-665 | 8 | 272.5 | -8.7 | 261.8 | -32.5 | 3.6 | Used-Antipode |
| ks80-1 | DirOPCA | T610-675 | 8 | 54.6 | 10.2 | 47.9 | 10.3 | 3.1 | Used |
| ks80-2 | DirOPCA | T590-670 | 7 | 50.8 | 34.7 | 28.7 | 27.3 | 4.6 | No use |
| ks80-4 | DirOPCA | T630-665 | 4 | 121.4 | 0.3 | 117.1 | 33.9 | 8.7 | No use |
| ks80-5 | DirOPCA | T590-660 | 5 | 102.7 | 11.1 | 91.0 | 37.5 | 3.0 | Used |
| ks80-6 | DirOPCA | T570-665 | 7 | 99.8 | 2.3 | 92.6 | 28.4 | 4.1 | Used |
| ks80-7 | DirOPCA | T570-665 | 7 | 83.3 | 4.4 | 75.5 | 22.1 | 3.7 | Used |
| ks80-8 | DirOPCA | T590-665 | 6 | 62.7 | 18.1 | 49.4 | 21.4 | 5.0 | Used |
| ks80-9 | DirOPCA | T570-680 | 10 | 81.4 | 15.1 | 67.2 | 29.8 | 3.0 | Used |
| ks81-2 | DirOPCA | T500-680 | 12 | 58.6 | -31.5 | 75.6 | -19.8 | 8.5 | Used |
| ks81-3 | DirOPCA | T540-675 | 10 | 51.2 | -24.5 | 65.6 | -18.4 | 1.8 | Used |
| ks81-4 | DirOPCA | T500-675 | 11 | 56.4 | -38.9 | 79.2 | -26.7 | 3.9 | Used |
| ks81-5 | DirOPCA | T570-670 | 8 | 70.6 | -36.6 | 87.3 | -18.0 | 6.1 | Used |
| ks81-6 | DirOPCA | T540-680 | 11 | 74.4 | -15.7 | 78.6 | 1.3 | 3.2 | Used |
| ks81-7 | DirOPCA | T540-680 | 11 | 73.9 | -16.9 | 78.8 | 0.1 | 2.5 | Used |
| ks81-8 | DirOPCA | T550-680 | 11 | 85.8 | -7.9 | 84.2 | 13.7 | 2.9 | Used |
| ks81-9 | DirOPCA | T525-680 | 14 | 74.8 | -7.3 | 74.4 | 8.7 | 2.6 | Used |
| ks81-11 | DirOPCA | T540-660 | 7 | 65.3 | -24.0 | 76.0 | -10.2 | 4.4 | Used |
| ks82-1 | DirOPCA | T610-680 | 8 | 84.8 | -8.3 | 81.5 | 17.9 | 3.4 | Used |
| ks82-2 | DirOPCA | T590-680 | 9 | 68.8 | -1.4 | 64.3 | 12.8 | 2.8 | Used |
| ks82-3 | DirOPCA | T570-680 | 10 | 84.2 | -2.9 | 77.5 | 21.8 | 1.6 | Used |
| ks82-4 | DirOPCA | T570-650 | 5 | 82.1 | -8.5 | 79.4 | 16.1 | 4.7 | Used |
| ks82-5 | DirOPCA | T540-670 | 9 | 84.7 | -5.9 | 79.9 | 19.7 | 3.7 | Used |
| ks82-6 | DirOPCA | T570-680 | 10 | 71.9 | 3.9 | 62.8 | 18.8 | 3.0 | Used |
| ks82-7 | DirOPCA | T540-675 | 10 | 43.8 | 19.1 | 31.8 | 9.9 | 4.4 | No use |
| ks82-8 | DirOPCA | T570-675 | 9 | 64.4 | 7.9 | 54.4 | 16.4 | 6.0 | Used |
| ks82-9 | DirOPCA | T550-680 | 13 | 61.4 | 6.7 | 53.1 | 13.5 | 2.4 | Used |
| ks82-10 | DirOPCA | T590-680 | 10 | 78.2 | 14.8 | 59.3 | 30.9 | 3.6 | Used |

Note. Abbreviations are the same as for the Table S2.