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Report CNC Parametric Curve Interpolation and Trajectory Tracking

Part 2 of 5 Ellipse and Skewed-Astroid (x-y) parametric curves

| ITEM | DESCRIPTION | ELLIPSE CURVE | | | | | SKEWED-ASTROID CURVE | | | | |
|------|--|---------------|----------|----------|----------|----------|----------------------|----------|----------|----------|----------|
| | | FC10 | FC20 | FC25 | FC30 | FC40 | FC10 | FC20 | FC25 | FC30 | FC40 |
| 1 | Run user feedrate command (mm/s) | | | | | | | | | | |
| 2 | Total interpolated u-points | 21575 | 7599 | 9448 | 8338 | 7351 | 116194 | 58102 | 46483 | 38738 | 29056 |
| 3 | Parameter completion (reached u-end) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | Pushdown epsilon eps(u) algorithm | | | | | | | | | | |
| 4 | Count before pushdown, eps(u) is below (1E-6) | 21396 | 1427 | 7046 | 5149 | 928 | 116194 | 58102 | 46483 | 38738 | 29056 |
| 5 | Count pushdown points, eps(u) to below (1E-6) | 179 | 6172 | 2402 | 3189 | 6423 | 0 | 0 | 0 | 0 | 0 |
| 6 | Check Total u-points | 21575 | 7599 | 9448 | 8338 | 7351 | 116194 | 58102 | 46483 | 38738 | 29056 |
| | Epsilon eps(u) chord error | | | | | | | | | | |
| 7 | Count eps(u) above (1E-6) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | Count eps(u) in (1E-7, 1E-6) | 7058 | 7599 | 9448 | 8338 | 7351 | 0 | 0 | 0 | 1455 | 8433 |
| 9 | Count eps(u) in (1E-8, 1E-7) | 14517 | 0 | 0 | 0 | 0 | 9483 | 33004 | 46483 | 37283 | 20623 |
| 10 | Count eps(u) in (1E-9, 1E-8) | 0 | 0 | 0 | 0 | 0 | 106711 | 25098 | 0 | 0 | 0 |
| 11 | Count eps(u) in (1E-10, 1E-9) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | Count eps(u) below (1E-10) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | Check Total eps(u) points | 21575 | 7599 | 9448 | 8338 | 7351 | 116194 | 58102 | 46483 | 38738 | 29056 |
| | Count interpolated u-points | | | | | | | | | | |
| 14 | Count_rising_S_curve u-points | 443 | 480 | 370 | 370 | 370 | 3673 | 1837 | 1470 | 1225 | 919 |
| 15 | Count_frate is_lower than fratelimit | 14764 | 4342 | 6120 | 5270 | 3308 | 75069 | 39802 | 31837 | 26531 | 19939 |
| 16 | Count_frate is_equal to fratelimit | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17 | Count_frate is_higher than fratelimit | 5926 | 2298 | 2589 | 2329 | 3304 | 33779 | 14626 | 11707 | 9757 | 7279 |
| 18 | Count_falling_S_curve u-points | 442 | 479 | 369 | 369 | 369 | 3673 | 1837 | 1469 | 1225 | 919 |
| 19 | Check Total u-points | 21575 | 7599 | 9448 | 8338 | 7351 | 116194 | 58102 | 46483 | 38738 | 29056 |
| | Count u-points histogram (G01 codes) | | | | | | | | | | |
| 20 | Count u-points [0.00 <= u < 0.10) | 1231 | 779 | 748 | 748 | 748 | 7322 | 3661 | 2929 | 2441 | 1831 |
| 21 | Count u-points [0.10 <= u < 0.20) | 2586 | 1292 | 1035 | 878 | 791 | 12603 | 6302 | 5042 | 4202 | 3151 |
| 22 | Count u-points [0.20 <= u < 0.30) | 3154 | 1578 | 1262 | 1051 | 797 | 18245 | 9123 | 7298 | 6081 | 4562 |
| 24 | Count u-points [0.30 <= u < 0.40) | 2586 | 1293 | 1034 | 863 | 710 | 12604 | 6302 | 5042 | 4202 | 3151 |
| 25 | Count u-points [0.40 <= u < 0.50) | 1230 | 704 | 644 | 628 | 629 | 7322 | 3662 | 2930 | 2442 | 1832 |
| 26 | Count u-points [0.50 <= u < 0.60) | 1228 | 704 | 644 | 629 | 629 | 7323 | 3662 | 2930 | 2442 | 1832 |
| 27 | Count u-points [0.60 <= u < 0.70) | 2586 | 1293 | 1034 | 862 | 710 | 12603 | 6302 | 5041 | 4201 | 3151 |
| 28 | Count u-points [0.70 <= u < 0.80) | 3155 | 1577 | 1262 | 1051 | 796 | 18244 | 9122 | 7298 | 6082 | 4561 |
| 29 | Count u-points [0.80 <= u < 0.90) | 2586 | 1293 | 1035 | 878 | 791 | 12604 | 6303 | 5043 | 4202 | 3152 |
| 30 | Count u-points [0.90 <= u <= 1.00] | 1233 | 782 | 750 | 750 | 750 | 7324 | 3663 | 2930 | 2443 | 1833 |
| 31 | Check Total u-points | 21575 | 11295 | 9448 | 8338 | 7351 | 116194 | 58102 | 46483 | 38738 | 29056 |
| 32 | Total curve error (sum of epsilon(u)) | 2.99E-03 | 7.14E-03 | 5.93E-03 | 6.56E-03 | 7.33E-03 | 5.16E-04 | 1.03E-03 | 1.29E-03 | 1.55E-03 | 2.06E-03 |
| 33 | Total dist traversed (sum of chord lengths) | 215.643 | 215.649 | 215.644 | 215.647 | 215.643 | 445.714 | 445.714 | 445.714 | 445.714 | 445.714 |

Sheet1

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| | NOTES | | | | | | | | | | |
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