

# Application of various machine learning models for process stability of bio-electrochemical anaerobic digestion

A-In Cheon <sup>1</sup>, Jwa-Kyung Sung <sup>2</sup>, Hang-Bae Jun <sup>1</sup>, Hee-Won Jang <sup>3</sup>, Min-Ji Kim <sup>1</sup>, Jun-Gyu Park <sup>3,\*</sup>

1. Department of Environmental Engineering, Chungbuk National University, Cheongju 28644, Republic of Korea

2. Department of Crop Science, Chungbuk National University, Cheongju 28644, Republic of Korea

3. Department of Advanced Energy Engineering, Chosun University, Gwangju 61457, Republic of Korea

\* Correspondence: jp@chosun.ac.kr; Tel: +82-62-230-7119; Fax: +82-62-210-7111

**Table S1.** Input and output data for various ML models.

| STAGE | DATE | INPUT |                |                     |               | OUTPUT                         |
|-------|------|-------|----------------|---------------------|---------------|--------------------------------|
|       |      | BEAD  |                |                     |               |                                |
|       |      | pH    | Alk.<br>(mg/L) | COD rem eff.<br>(%) | VFAs<br>(ppm) | Methane yield<br>(L-CH4/g-COD) |
| 1     | 7    | 7.25  | 7550           | 46.38               | 6604          | 0.018                          |
|       | 8    | 7.31  | 7330           | 52.46               | 6506          | 0.017                          |
|       | 9    | 7.25  | 7880           | 58.50               | 5980          | 0.022                          |
|       | 10   | 7.38  | 7880           | 54.92               | 5348          | 0.083                          |
|       | 14   | 7.4   | 6770           | 55.90               | 5094          | 0.118                          |
|       | 15   | 7.5   | 6300           | 58.43               | 4591          | 0.098                          |
|       | 18   | 7.45  | 6833           | 60.68               | 4387          | 0.122                          |
|       | 19   | 7.48  | 6610           | 64.94               | 4008          | 0.130                          |
|       | 25   | 7.66  | 6770           | 62.42               | 4320          | 0.133                          |
|       | 37   | 7.56  | 6670           | 63.31               | 4172          | 0.139                          |
|       | 39   | 7.81  | 6610           | 58.73               | 3178          | 0.182                          |
|       | 40   | 7.49  | 6850           | 60.60               | 3277          | 0.170                          |
|       | 46   | 7.38  | 6960           | 62.48               | 3293          | 0.179                          |
|       | 49   | 7.32  | 6780           | 64.37               | 3166          | 0.190                          |
|       | 64   | 7.35  | 6100           | 61.33               | 3177          | 0.191                          |
|       | 80   | 7.34  | 6200           | 61.95               | 3234          | 0.203                          |
|       | 92   | 7.28  | 6980           | 64.19               | 3096          | 0.198                          |
|       | 95   | 7.29  | 6860           | 61.66               | 3078          | 0.214                          |
|       | 100  | 7.31  | 6840           | 62.87               | 3192          | 0.198                          |
|       | 105  | 7.69  | 6970           | 63.78               | 3132          | 0.196                          |
|       | 110  | 7.52  | 6710           | 63.40               | 3098          | 0.196                          |
|       | 118  | 7.35  | 7910           | 66.84               | 3226          | 0.206                          |
|       | 127  | 7.38  | 7644           | 67.55               | 3059          | 0.217                          |
|       | 130  | 7.37  | 6844           | 67.58               | 2959          | 0.210                          |
|       | 132  | 7.44  | 7111           | 65.98               | 2920          | 0.220                          |
|       | 137  | 7.34  | 6890           | 67.09               | 2842          | 0.221                          |
|       | 138  | 7.43  | 6822           | 68.77               | 2605          | 0.220                          |
|       | 139  | 7.35  | 6582           | 68.31               | 2783          | 0.227                          |
|       | 141  | 7.37  | 6266           | 68.63               | 2741          | 0.225                          |

|     |      |      |       |      |       |
|-----|------|------|-------|------|-------|
| 144 | 7.32 | 6022 | 66.07 | 2667 | 0.222 |
| 145 | 7.37 | 6622 | 67.93 | 2647 | 0.245 |
| 147 | 7.38 | 6466 | 64.70 | 2698 | 0.229 |
| 152 | 7.12 | 6711 | 68.89 | 2516 | 0.233 |
| 154 | 7.17 | 6888 | 63.49 | 2539 | 0.247 |
| 159 | 7.18 | 6266 | 67.60 | 2611 | 0.214 |
| 162 | 7.19 | 6755 | 68.63 | 2672 | 0.224 |
| 166 | 7.16 | 5866 | 69.46 | 2514 | 0.227 |
| 175 | 7.18 | 6300 | 70.29 | 2592 | 0.215 |
| 186 | 7.23 | 6700 | 70.55 | 2516 | 0.215 |
| 195 | 7.38 | 6700 | 72.39 | 2510 | 0.219 |
| 197 | 7.67 | 6900 | 70.88 | 2550 | 0.219 |
| 200 | 7.69 | 6900 | 72.20 | 2680 | 0.232 |
| 202 | 7.79 | 6700 | 69.89 | 2580 | 0.224 |
| 204 | 7.72 | 6700 | 70.16 | 2590 | 0.255 |
| 207 | 7.78 | 6685 | 70.03 | 2575 | 0.229 |
| 209 | 7.77 | 6900 | 68.83 | 2778 | 0.225 |
| 211 | 7.68 | 6750 | 70.07 | 2680 | 0.225 |
| 214 | 7.63 | 6900 | 72.63 | 2650 | 0.237 |
| 216 | 7.68 | 7150 | 68.85 | 2750 | 0.236 |
| 218 | 7.63 | 6900 | 70.17 | 2680 | 0.254 |
| 221 | 7.65 | 6680 | 68.16 | 2450 | 0.228 |
| 223 | 7.68 | 7100 | 68.28 | 2540 | 0.256 |
| 225 | 7.66 | 7650 | 66.12 | 2280 | 0.249 |
| 230 | 7.81 | 7500 | 67.34 | 2350 | 0.255 |
| 232 | 7.82 | 7850 | 65.74 | 2350 | 0.247 |
| 235 | 7.8  | 8000 | 66.52 | 2240 | 0.242 |
| 237 | 7.81 | 8150 | 67.49 | 2372 | 0.240 |
| 239 | 7.79 | 8215 | 68.26 | 2341 | 0.238 |
| 242 | 7.75 | 8150 | 71.21 | 2248 | 0.245 |
| 244 | 7.85 | 7995 | 71.17 | 2195 | 0.246 |
| 246 | 7.76 | 8320 | 69.89 | 2195 | 0.242 |
| 249 | 7.84 | 8236 | 70.07 | 2278 | 0.240 |
| 251 | 7.82 | 8420 | 70.99 | 2193 | 0.251 |
| 253 | 7.83 | 8540 | 70.81 | 2142 | 0.257 |
| 256 | 7.92 | 7900 | 68.90 | 2048 | 0.262 |
| 258 | 7.96 | 7986 | 69.21 | 2098 | 0.265 |
| 260 | 7.85 | 8250 | 66.94 | 2150 | 0.262 |
| 265 | 7.93 | 8400 | 67.80 | 2080 | 0.252 |
| 267 | 7.95 | 8400 | 68.15 | 1995 | 0.255 |
| 273 | 8.05 | 8200 | 66.59 | 1985 | 0.271 |
| 276 | 8.12 | 7190 | 69.48 | 1995 | 0.285 |
| 282 | 8.06 | 7980 | 69.18 | 1910 | 0.298 |
| 290 | 8.16 | 8200 | 75.57 | 2100 | 0.271 |
| 292 | 8.25 | 8600 | 76.94 | 1862 | 0.271 |
| 294 | 8.3  | 9100 | 77.00 | 1925 | 0.273 |

|   |     |      |       |       |      |       |
|---|-----|------|-------|-------|------|-------|
|   | 296 | 8.28 | 8500  | 77.43 | 1850 | 0.283 |
|   | 298 | 8.19 | 7500  | 80.49 | 1850 | 0.303 |
|   | 300 | 8    | 8900  | 80.45 | 1846 | 0.303 |
|   | 302 | 7.9  | 8100  | 82.46 | 1910 | 0.303 |
|   | 304 | 7.98 | 7860  | 84.55 | 1750 | 0.309 |
|   | 306 | 7.95 | 7400  | 79.39 | 1842 | 0.317 |
|   | 308 | 7.98 | 7750  | 84.18 | 1850 | 0.306 |
|   | 310 | 7.85 | 7800  | 80.74 | 1877 | 0.313 |
|   | 312 | 7.95 | 8200  | 82.83 | 1799 | 0.310 |
|   | 314 | 8.24 | 8500  | 82.31 | 1800 | 0.299 |
|   | 316 | 8.06 | 8360  | 83.31 | 1910 | 0.294 |
|   | 318 | 7.85 | 7900  | 82.27 | 1950 | 0.318 |
|   | 320 | 7.98 | 7900  | 81.83 | 1875 | 0.302 |
|   | 322 | 7.9  | 7500  | 83.66 | 1842 | 0.293 |
|   | 324 | 7.96 | 8000  | 82.32 | 1826 | 0.307 |
|   | 326 | 7.92 | 7200  | 82.21 | 1798 | 0.316 |
|   | 328 | 7.95 | 7800  | 80.94 | 1850 | 0.319 |
|   | 330 | 7.99 | 8000  | 80.46 | 1850 | 0.308 |
|   | 332 | 7.97 | 7900  | 82.90 | 1799 | 0.299 |
|   | 334 | 7.86 | 7700  | 83.70 | 1780 | 0.301 |
|   | 336 | 7.96 | 8200  | 82.39 | 1910 | 0.299 |
|   | 338 | 7.95 | 7800  | 80.92 | 1910 | 0.308 |
|   | 340 | 7.85 | 8100  | 80.90 | 1900 | 0.304 |
|   | 342 | 7.83 | 7700  | 81.29 | 1850 | 0.297 |
|   | 344 | 7.81 | 8000  | 81.25 | 1849 | 0.299 |
|   | 346 | 7.82 | 7900  | 83.20 | 1857 | 0.299 |
|   | 348 | 7.89 | 8120  | 82.96 | 1879 | 0.303 |
|   | 350 | 7.84 | 8100  | 83.24 | 1888 | 0.325 |
|   | 352 | 7.88 | 7890  | 83.19 | 1800 | 0.284 |
|   | 354 | 7.85 | 7500  | 83.53 | 1850 | 0.291 |
|   | 356 | 7.96 | 7950  | 83.57 | 1750 | 0.284 |
|   | 358 | 7.88 | 8200  | 82.69 | 1750 | 0.297 |
|   | 360 | 7.89 | 7890  | 82.31 | 1648 | 0.320 |
|   | 362 | 7.92 | 10000 | 81.67 | 1600 | 0.315 |
|   | 364 | 7.89 | 9500  | 82.92 | 1600 | 0.300 |
| 2 | 366 | 7.56 | 11300 | 87.48 | 2195 | 0.206 |
|   | 369 | 7.62 | 10300 | 84.69 | 2465 | 0.243 |
|   | 372 | 7.75 | 10000 | 81.42 | 2545 | 0.207 |
|   | 375 | 7.72 | 10400 | 81.15 | 2768 | 0.226 |
|   | 378 | 7.68 | 10700 | 80.25 | 2756 | 0.230 |
|   | 381 | 7.62 | 10500 | 76.97 | 2750 | 0.257 |
|   | 384 | 7.85 | 10300 | 81.14 | 2958 | 0.236 |
|   | 387 | 8.11 | 10300 | 80.58 | 3012 | 0.222 |
|   | 390 | 8.15 | 9800  | 79.04 | 2765 | 0.261 |
|   | 393 | 8.04 | 10300 | 80.16 | 2685 | 0.266 |
|   | 396 | 8.17 | 10500 | 81.86 | 2954 | 0.236 |

|     |      |       |       |      |       |
|-----|------|-------|-------|------|-------|
| 399 | 7.95 | 10800 | 82.14 | 2954 | 0.265 |
| 402 | 7.86 | 11200 | 81.67 | 3252 | 0.270 |
| 405 | 7.95 | 9500  | 81.32 | 2785 | 0.273 |
| 408 | 7.92 | 10900 | 80.29 | 3180 | 0.289 |
| 411 | 7.92 | 10700 | 81.76 | 2893 | 0.269 |
| 414 | 7.96 | 9500  | 79.87 | 2658 | 0.322 |
| 417 | 8.02 | 10500 | 80.66 | 3165 | 0.300 |
| 420 | 8.02 | 10200 | 82.32 | 3200 | 0.280 |
| 423 | 7.86 | 10000 | 83.12 | 3350 | 0.314 |
| 426 | 7.9  | 9800  | 82.84 | 3125 | 0.311 |
| 429 | 7.98 | 9500  | 83.65 | 3240 | 0.292 |
| 432 | 7.99 | 10700 | 83.48 | 3142 | 0.303 |
| 435 | 7.82 | 11100 | 80.96 | 3015 | 0.329 |
| 438 | 8.05 | 10000 | 82.56 | 2865 | 0.306 |
| 441 | 8.12 | 9700  | 83.37 | 2994 | 0.288 |
| 444 | 7.96 | 11200 | 81.69 | 3210 | 0.319 |
| 447 | 8.25 | 10100 | 83.83 | 3100 | 0.322 |
| 450 | 8.08 | 11400 | 83.30 | 3325 | 0.317 |
| 453 | 8    | 11800 | 80.58 | 3250 | 0.311 |
| 456 | 8.28 | 11500 | 81.30 | 3160 | 0.322 |
| 459 | 8.14 | 10900 | 81.98 | 3310 | 0.328 |
| 462 | 8.24 | 10500 | 84.73 | 3160 | 0.295 |
| 465 | 7.95 | 10500 | 84.65 | 3425 | 0.290 |
| 468 | 8.02 | 11500 | 84.21 | 3041 | 0.289 |
| 471 | 8.39 | 10200 | 83.88 | 2875 | 0.292 |
| 474 | 8    | 10500 | 81.39 | 2952 | 0.341 |
| 477 | 8.05 | 9800  | 83.87 | 3100 | 0.305 |
| 480 | 7.94 | 9600  | 84.08 | 3050 | 0.309 |
| 483 | 8.12 | 10100 | 84.64 | 3205 | 0.314 |
| 486 | 8.02 | 10500 | 84.46 | 3305 | 0.318 |
| 489 | 7.99 | 11200 | 83.52 | 3400 | 0.310 |
| 492 | 8.05 | 10100 | 83.16 | 3300 | 0.309 |
| 495 | 8.1  | 11200 | 84.13 | 3200 | 0.317 |
| 498 | 8.12 | 10500 | 85.66 | 3406 | 0.306 |
| 501 | 8    | 11000 | 85.06 | 3130 | 0.300 |
| 504 | 8.12 | 10400 | 85.51 | 3400 | 0.307 |
| 507 | 8.26 | 10100 | 84.66 | 3050 | 0.338 |
| 510 | 8.24 | 11200 | 84.47 | 3010 | 0.330 |
| 514 | 8.2  | 11000 | 86.40 | 2890 | 0.300 |
| 518 | 8.06 | 10900 | 84.44 | 3120 | 0.335 |
| 522 | 8.24 | 11500 | 85.79 | 2995 | 0.310 |
| 526 | 8.23 | 11900 | 85.69 | 3260 | 0.311 |
| 530 | 8.25 | 12100 | 85.98 | 3240 | 0.310 |
| 534 | 8.22 | 10600 | 85.64 | 3150 | 0.341 |
| 538 | 8.16 | 11200 | 86.96 | 3325 | 0.312 |
| 542 | 8.16 | 12150 | 87.57 | 3350 | 0.314 |

|   |     |      |       |       |      |       |
|---|-----|------|-------|-------|------|-------|
|   | 546 | 8.12 | 12000 | 86.87 | 3150 | 0.343 |
|   | 550 | 8.09 | 12100 | 87.53 | 3060 | 0.336 |
|   | 554 | 8.12 | 11560 | 87.85 | 3250 | 0.328 |
|   | 558 | 8.25 | 12000 | 87.40 | 3025 | 0.364 |
|   | 562 | 8.12 | 11590 | 87.42 | 3154 | 0.344 |
|   | 566 | 8.25 | 11540 | 88.31 | 3065 | 0.313 |
|   | 570 | 8.09 | 11400 | 89.13 | 3245 | 0.321 |
|   | 574 | 8.23 | 11890 | 88.78 | 3350 | 0.320 |
|   | 578 | 8.17 | 12350 | 86.66 | 3152 | 0.363 |
|   | 582 | 7.92 | 12400 | 87.08 | 3320 | 0.344 |
|   | 586 | 8.02 | 12700 | 85.50 | 3131 | 0.328 |
|   | 590 | 8.12 | 12800 | 86.64 | 3250 | 0.351 |
|   | 594 | 7.95 | 12400 | 87.50 | 3150 | 0.341 |
|   | 598 | 8.24 | 11900 | 87.62 | 3250 | 0.318 |
| 3 | 603 | 8.21 | 11800 | 90.54 | 3165 | 0.252 |
|   | 606 | 8.2  | 12500 | 87.65 | 3725 | 0.237 |
|   | 609 | 7.89 | 12700 | 86.17 | 3992 | 0.206 |
|   | 612 | 8.15 | 12400 | 82.15 | 4250 | 0.206 |
|   | 615 | 8.19 | 12600 | 81.88 | 4525 | 0.242 |
|   | 618 | 8.12 | 11900 | 85.22 | 4332 | 0.240 |
|   | 621 | 7.82 | 12700 | 84.32 | 4197 | 0.249 |
|   | 624 | 7.92 | 13500 | 85.37 | 3870 | 0.282 |
|   | 627 | 8.16 | 13400 | 86.19 | 4452 | 0.270 |
|   | 630 | 8.26 | 13900 | 86.38 | 3784 | 0.289 |
|   | 633 | 8.24 | 12900 | 86.11 | 3837 | 0.295 |
|   | 636 | 8.29 | 13500 | 87.82 | 3913 | 0.303 |
|   | 639 | 8.27 | 13700 | 88.20 | 3696 | 0.301 |
|   | 642 | 8.26 | 12900 | 88.38 | 3931 | 0.317 |
|   | 645 | 8.12 | 13800 | 87.84 | 3696 | 0.312 |
|   | 648 | 7.86 | 13700 | 87.90 | 3788 | 0.295 |
|   | 651 | 8.16 | 14200 | 86.63 | 3871 | 0.321 |
|   | 654 | 7.86 | 13900 | 86.93 | 3722 | 0.331 |
|   | 657 | 8.1  | 14100 | 87.96 | 3645 | 0.334 |
|   | 660 | 8.2  | 14500 | 88.27 | 4054 | 0.322 |
|   | 663 | 8.15 | 14200 | 87.31 | 3871 | 0.324 |
|   | 666 | 8.2  | 14200 | 88.79 | 4022 | 0.324 |
|   | 669 | 8.13 | 13900 | 89.53 | 3870 | 0.326 |
|   | 672 | 8.17 | 13700 | 89.97 | 3587 | 0.319 |
|   | 675 | 8.13 | 14600 | 89.46 | 3691 | 0.312 |
|   | 678 | 8.19 | 14100 | 88.92 | 4109 | 0.320 |
|   | 681 | 8.12 | 13500 | 90.21 | 4024 | 0.327 |
|   | 684 | 8.09 | 13800 | 89.23 | 3870 | 0.325 |
|   | 687 | 8.07 | 14500 | 89.39 | 3590 | 0.339 |
|   | 690 | 8.12 | 14100 | 90.38 | 3784 | 0.340 |
|   | 693 | 8.12 | 14800 | 90.39 | 3958 | 0.323 |
|   | 696 | 8.21 | 13900 | 91.06 | 4132 | 0.338 |

|   |     |      |       |       |      |       |
|---|-----|------|-------|-------|------|-------|
|   | 699 | 8.16 | 14000 | 90.77 | 4022 | 0.337 |
|   | 702 | 8.06 | 14500 | 90.68 | 3875 | 0.358 |
|   | 705 | 8.09 | 13600 | 91.17 | 3703 | 0.326 |
|   | 708 | 8.1  | 14600 | 89.54 | 3683 | 0.328 |
|   | 711 | 8.12 | 14900 | 90.28 | 4028 | 0.330 |
|   | 714 | 8.16 | 14800 | 90.16 | 3957 | 0.338 |
|   | 717 | 8.2  | 14600 | 89.16 | 3574 | 0.348 |
|   | 720 | 8.15 | 13500 | 89.68 | 3699 | 0.343 |
|   | 723 | 8.1  | 13550 | 89.70 | 3587 | 0.351 |
|   | 726 | 8.09 | 14100 | 89.63 | 4021 | 0.347 |
|   | 729 | 8.09 | 14800 | 89.36 | 3871 | 0.327 |
|   | 732 | 8.12 | 13600 | 90.31 | 3784 | 0.322 |
|   | 735 | 8.16 | 13900 | 90.44 | 3587 | 0.346 |
|   | 740 | 8.12 | 14500 | 90.99 | 3762 | 0.334 |
|   | 745 | 8.15 | 14600 | 90.70 | 3848 | 0.336 |
|   | 750 | 8.12 | 14200 | 90.82 | 3683 | 0.347 |
|   | 755 | 8.2  | 14200 | 90.86 | 3761 | 0.351 |
|   | 760 | 8.1  | 14600 | 91.09 | 3697 | 0.338 |
|   | 765 | 8.12 | 15100 | 90.29 | 3952 | 0.357 |
|   | 770 | 8.2  | 15200 | 90.36 | 4132 | 0.353 |
|   | 775 | 8.16 | 14400 | 89.82 | 4022 | 0.337 |
|   | 780 | 8.05 | 15000 | 90.21 | 3699 | 0.344 |
|   | 785 | 8.05 | 14250 | 89.88 | 4022 | 0.353 |
|   | 790 | 8.21 | 14800 | 89.58 | 3787 | 0.345 |
|   | 795 | 8.12 | 15300 | 90.35 | 4109 | 0.344 |
| 4 | 800 | 8.05 | 15200 | 90.88 | 4074 | 0.262 |
|   | 805 | 8.01 | 14500 | 88.40 | 4283 | 0.264 |
|   | 810 | 7.89 | 13650 | 87.58 | 4532 | 0.268 |
|   | 815 | 7.79 | 13200 | 89.17 | 4543 | 0.267 |
|   | 820 | 7.79 | 13100 | 89.76 | 4741 | 0.274 |
|   | 825 | 7.86 | 13600 | 90.34 | 4654 | 0.273 |
|   | 830 | 7.92 | 14100 | 90.55 | 4891 | 0.292 |
|   | 835 | 8.12 | 14000 | 90.40 | 4870 | 0.305 |
|   | 840 | 8.05 | 14200 | 90.62 | 4854 | 0.301 |
|   | 845 | 8.13 | 15100 | 90.80 | 4950 | 0.316 |
|   | 850 | 8.26 | 14800 | 90.81 | 5002 | 0.322 |
|   | 855 | 8.34 | 15320 | 91.61 | 4861 | 0.306 |
|   | 860 | 8.12 | 14700 | 92.20 | 4926 | 0.303 |
|   | 865 | 8.26 | 16100 | 91.91 | 4256 | 0.321 |
|   | 870 | 8.12 | 15800 | 92.02 | 4552 | 0.326 |
|   | 875 | 8.15 | 15500 | 91.36 | 4757 | 0.325 |
|   | 880 | 8.2  | 14200 | 92.21 | 4553 | 0.318 |
|   | 885 | 8.06 | 15200 | 92.00 | 4411 | 0.308 |
|   | 890 | 8.05 | 15400 | 92.23 | 4762 | 0.302 |
|   | 895 | 8.19 | 15500 | 91.98 | 4395 | 0.315 |
|   | 900 | 8.12 | 14900 | 92.51 | 4486 | 0.297 |

|   |      |      |       |       |      |       |
|---|------|------|-------|-------|------|-------|
|   | 905  | 8.21 | 14800 | 92.70 | 4844 | 0.318 |
|   | 910  | 8.09 | 14600 | 92.00 | 4417 | 0.302 |
|   | 915  | 8.12 | 15100 | 92.45 | 4491 | 0.298 |
|   | 920  | 8.11 | 15700 | 92.33 | 4303 | 0.316 |
|   | 925  | 8.25 | 15200 | 92.27 | 4560 | 0.299 |
|   | 930  | 8.09 | 15500 | 92.27 | 4690 | 0.302 |
|   | 935  | 8.09 | 15000 | 92.16 | 4577 | 0.312 |
|   | 940  | 8.15 | 14800 | 92.36 | 4630 | 0.320 |
|   | 945  | 8.21 | 15300 | 92.37 | 4445 | 0.327 |
|   | 950  | 8.22 | 15100 | 92.65 | 4835 | 0.322 |
| 5 | 955  | 8.09 | 15600 | 93.34 | 4941 | 0.234 |
|   | 960  | 8.13 | 14200 | 92.04 | 5210 | 0.267 |
|   | 965  | 8.04 | 13900 | 93.02 | 5080 | 0.283 |
|   | 970  | 7.99 | 13400 | 92.00 | 5506 | 0.279 |
|   | 975  | 7.85 | 14500 | 91.22 | 5413 | 0.269 |
|   | 980  | 7.8  | 16100 | 92.11 | 5517 | 0.263 |
|   | 985  | 7.78 | 15200 | 92.34 | 5326 | 0.280 |
|   | 990  | 7.96 | 16000 | 92.58 | 5657 | 0.283 |
|   | 995  | 8.2  | 15800 | 92.84 | 5761 | 0.295 |
|   | 1000 | 8.12 | 15400 | 93.07 | 5689 | 0.299 |
|   | 1005 | 8.02 | 16400 | 93.32 | 5796 | 0.305 |
|   | 1010 | 8.21 | 15100 | 93.24 | 5350 | 0.284 |
|   | 1015 | 8.22 | 15200 | 93.33 | 5500 | 0.291 |
|   | 1020 | 8.15 | 15400 | 93.33 | 5263 | 0.293 |
|   | 1025 | 8.21 | 15000 | 93.35 | 5413 | 0.281 |
|   | 1030 | 8.19 | 15600 | 93.17 | 5165 | 0.296 |
|   | 1035 | 8.12 | 16100 | 93.33 | 5115 | 0.290 |
|   | 1040 | 8.25 | 15400 | 92.37 | 5261 | 0.291 |
|   | 1045 | 8.13 | 15200 | 92.96 | 5039 | 0.291 |
|   | 1050 | 8.1  | 15700 | 93.33 | 5167 | 0.287 |
|   | 1055 | 8.21 | 14800 | 93.67 | 5113 | 0.289 |
|   | 1060 | 8.2  | 15700 | 93.24 | 5252 | 0.284 |
|   | 1065 | 8.16 | 15400 | 93.33 | 5322 | 0.291 |
|   | 1070 | 8.15 | 14900 | 93.11 | 5174 | 0.303 |
|   | 1075 | 8.21 | 15300 | 92.94 | 5074 | 0.299 |
|   | 1080 | 8.04 | 15500 | 93.06 | 5150 | 0.301 |
|   | 1085 | 8.19 | 15200 | 92.91 | 5103 | 0.287 |