

Options: queue, random restart, no recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time  |        |        |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|-------|--------|--------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S    | tS     | 1B     | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 84 | 88 | 85 | 87 | 22.96 | 31.57  | 48.32  | 50.72  | 44.83       | 51.72 | 46.55 | 50.00 |
| G150p20E*  | 86              | 95 | 96 | 97 | 97 | 67.96 | 101.01 | 150.89 | 164.30 | 10.47       | 11.63 | 12.79 | 12.79 |
| Avg.       |                 |    |    |    |    | 44.46 | 67.30  | 100.62 | 107.51 | 27.65       | 32.69 | 30.68 | 31.40 |

Options: queue, random restart, approximate recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time  |       |        |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|-------|-------|--------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S    | tS    | 1B     | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 84 | 85 | 87 | 85 | 14.45 | 28.76 | 36.60  | 47.30  | 44.83       | 46.55 | 50.00 | 46.55 |
| G150p20E*  | 86              | 94 | 96 | 97 | 96 | 41.41 | 87.66 | 107.90 | 147.48 | 9.30        | 11.63 | 12.79 | 11.63 |
| Avg.       |                 |    |    |    |    | 26.93 | 59.22 | 73.26  | 97.39  | 27.06       | 30.10 | 32.41 | 29.09 |

Options: queue, random restart, exact recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time   |        |        |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|--------|--------|--------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S     | tS     | 1B     | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 82 | 84 | 85 | 85 | 36.23  | 97.37  | 82.51  | 118.19 | 41.38       | 44.83 | 46.55 | 46.55 |
| G150p20E*  | 86              | 95 | 94 | 96 | 97 | 140.86 | 436.47 | 292.24 | 477.65 | 10.47       | 9.30  | 11.63 | 12.79 |
| Avg.       |                 |    |    |    |    | 87.55  | 267.93 | 188.39 | 297.92 | 25.92       | 28.08 | 30.10 | 29.67 |

Options: queue, perturbation restart, no recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time  |       |        |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|-------|-------|--------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S    | tS    | 1B     | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 86 | 87 | 87 | 86 | 21.57 | 27.99 | 44.60  | 47.06  | 48.28       | 50.00 | 50.00 | 48.28 |
| G150p20E*  | 86              | 95 | 95 | 95 | 97 | 70.49 | 90.00 | 140.89 | 151.92 | 10.47       | 10.47 | 10.47 | 12.79 |
| Avg.       |                 |    |    |    |    | 45.03 | 60.00 | 93.76  | 99.49  | 29.37       | 31.24 | 31.24 | 30.53 |

Options: queue, perturbation restart, approximate recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time  |       |       |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|-------|-------|-------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S    | tS    | 1B    | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 86 | 85 | 84 | 85 | 13.22 | 22.70 | 32.93 | 40.17  | 48.28       | 46.55 | 44.83 | 46.55 |
| G150p20E*  | 86              | 95 | 94 | 94 | 95 | 36.97 | 73.26 | 91.71 | 125.26 | 10.47       | 9.30  | 9.30  | 10.47 |
| Avg.       |                 |    |    |    |    | 24.10 | 48.99 | 63.33 | 82.71  | 29.37       | 28.94 | 28.08 | 28.51 |

Options: queue, perturbation restart, exact recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time   |        |        |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|--------|--------|--------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S     | tS     | 1B     | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 82 | 83 | 83 | 83 | 33.31  | 80.66  | 75.82  | 107.26 | 41.38       | 43.10 | 43.10 | 43.10 |
| G150p20E*  | 86              | 92 | 92 | 93 | 93 | 111.90 | 374.92 | 263.52 | 438.08 | 6.98        | 6.98  | 8.14  | 8.14  |
| Avg.       |                 |    |    |    |    | 71.61  | 228.80 | 170.68 | 272.67 | 24.18       | 26.05 | 26.63 | 25.62 |

Options: stack, random restart, no recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time  |        |        |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|-------|--------|--------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S    | tS     | 1B     | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 87 | 86 | 86 | 87 | 28.34 | 36.32  | 68.38  | 65.11  | 50.00       | 48.28 | 48.28 | 50.00 |
| G150p20E*  | 86              | 96 | 97 | 96 | 98 | 90.35 | 123.57 | 222.10 | 207.96 | 11.63       | 12.79 | 11.63 | 13.95 |
| Avg.       |                 |    |    |    |    | 58.35 | 80.95  | 146.25 | 136.54 | 30.81       | 31.54 | 30.96 | 31.98 |

Options: stack, random restart, approximate recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time  |        |        |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|-------|--------|--------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S    | tS     | 1B     | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 83 | 85 | 83 | 85 | 17.89 | 35.01  | 48.22  | 58.37  | 43.10       | 46.55 | 43.10 | 46.55 |
| G150p20E*  | 86              | 95 | 96 | 95 | 97 | 50.93 | 112.83 | 154.58 | 197.58 | 10.47       | 11.63 | 10.47 | 12.79 |
| Avg.       |                 |    |    |    |    | 33.41 | 74.93  | 102.41 | 127.97 | 26.78       | 30.10 | 27.79 | 29.67 |

Options: stack, random restart, exact recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time   |        |        |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|--------|--------|--------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S     | tS     | 1B     | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 84 | 85 | 84 | 83 | 43.68  | 96.28  | 91.32  | 126.97 | 44.83       | 46.55 | 44.83 | 43.10 |
| G150p20E*  | 86              | 92 | 95 | 94 | 96 | 169.02 | 442.30 | 361.03 | 513.56 | 6.98        | 10.47 | 9.30  | 11.63 |
| Avg.       |                 |    |    |    |    | 105.35 | 270.30 | 227.19 | 320.27 | 25.90       | 29.52 | 28.08 | 27.37 |

Options: stack, perturbation restart, no recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time  |        |        |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|-------|--------|--------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S    | tS     | 1B     | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 86 | 83 | 85 | 88 | 27.18 | 36.42  | 59.96  | 66.22  | 48.28       | 43.10 | 46.55 | 51.72 |
| G150p20E*  | 86              | 93 | 96 | 95 | 97 | 89.56 | 121.16 | 225.12 | 196.77 | 8.14        | 11.63 | 10.47 | 12.79 |
| Avg.       |                 |    |    |    |    | 57.37 | 79.80  | 143.55 | 131.49 | 28.21       | 28.38 | 29.52 | 32.26 |

Options: stack, perturbation restart, approximate recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time  |        |        |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|-------|--------|--------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S    | tS     | 1B     | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 84 | 83 | 84 | 82 | 16.33 | 30.73  | 41.50  | 54.24  | 44.83       | 43.10 | 44.83 | 41.38 |
| G150p20E*  | 86              | 95 | 94 | 95 | 96 | 49.43 | 102.12 | 144.50 | 185.25 | 10.47       | 9.30  | 10.47 | 11.63 |
| Avg.       |                 |    |    |    |    | 31.88 | 67.43  | 94.01  | 119.75 | 27.65       | 27.21 | 28.66 | 26.50 |

Options: stack, perturbation restart, exact recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time   |        |        |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|--------|--------|--------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S     | tS     | 1B     | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 82 | 83 | 83 | 84 | 40.13  | 82.43  | 83.97  | 111.97 | 41.38       | 43.10 | 43.10 | 44.83 |
| G150p20E*  | 86              | 91 | 93 | 90 | 93 | 155.23 | 385.72 | 363.95 | 535.62 | 5.81        | 8.14  | 4.65  | 8.14  |
| Avg.       |                 |    |    |    |    | 96.68  | 235.08 | 224.97 | 323.79 | 23.60       | 26.63 | 24.89 | 26.48 |

Options: priority queue, random restart, no recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time  |        |        |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|-------|--------|--------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S    | tS     | 1B     | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 88 | 84 | 86 | 88 | 30.79 | 30.03  | 55.78  | 60.30  | 51.72       | 44.83 | 48.28 | 51.72 |
| G150p20E*  | 86              | 96 | 97 | 96 | 97 | 98.38 | 105.32 | 185.45 | 188.49 | 11.63       | 12.79 | 11.63 | 12.79 |
| Avg.       |                 |    |    |    |    | 63.59 | 68.68  | 121.63 | 124.40 | 31.68       | 29.82 | 30.96 | 32.26 |

Options: priority queue, random restart, approximate recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time  |       |        |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|-------|-------|--------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S    | tS    | 1B     | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 83 | 85 | 85 | 88 | 22.11 | 30.53 | 43.70  | 54.88  | 43.10       | 46.55 | 46.55 | 51.72 |
| G150p20E*  | 86              | 96 | 97 | 97 | 96 | 64.56 | 92.76 | 128.24 | 177.25 | 11.63       | 12.79 | 12.79 | 11.63 |
| Avg.       |                 |    |    |    |    | 42.34 | 62.65 | 86.98  | 116.07 | 27.37       | 30.68 | 30.68 | 31.68 |

Options: priority queue, random restart, exact recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time   |        |        |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|--------|--------|--------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S     | tS     | 1B     | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 83 | 83 | 84 | 85 | 41.29  | 77.76  | 78.66  | 112.04 | 43.10       | 43.10 | 44.83 | 46.55 |
| G150p20E*  | 86              | 95 | 94 | 96 | 95 | 157.84 | 330.19 | 292.02 | 454.82 | 10.47       | 9.30  | 11.63 | 10.47 |
| Avg.       |                 |    |    |    |    | 98.57  | 204.98 | 186.35 | 283.43 | 26.78       | 27.21 | 29.24 | 28.51 |

Options: priority queue, perturbation restart, no recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time  |        |        |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|-------|--------|--------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S    | tS     | 1B     | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 84 | 87 | 87 | 87 | 28.62 | 30.35  | 53.79  | 53.47  | 44.83       | 50.00 | 50.00 | 50.00 |
| G150p20E*  | 86              | 95 | 93 | 96 | 96 | 91.27 | 100.11 | 175.35 | 179.85 | 10.47       | 8.14  | 11.63 | 11.63 |
| Avg.       |                 |    |    |    |    | 58.95 | 66.24  | 115.58 | 116.66 | 27.65       | 30.08 | 31.82 | 30.81 |

Options: priority queue, perturbation restart, approximate recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time  |       |        |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|-------|-------|--------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S    | tS    | 1B     | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 82 | 87 | 82 | 81 | 19.27 | 27.65 | 40.75  | 45.56  | 41.38       | 50.00 | 41.38 | 39.66 |
| G150p20E*  | 86              | 94 | 95 | 94 | 95 | 59.37 | 81.56 | 117.13 | 155.46 | 9.30        | 10.47 | 9.30  | 10.47 |
| Avg.       |                 |    |    |    |    | 38.32 | 55.61 | 79.95  | 100.51 | 25.34       | 31.24 | 26.35 | 25.06 |

Options: priority queue, perturbation restart, exact recentering

| Pr.<br>No. | Objective Value |    |    |    |    | Time   |        |        |        | % Deviation |       |       |       |
|------------|-----------------|----|----|----|----|--------|--------|--------|--------|-------------|-------|-------|-------|
|            | BK              | 1S | tS | 1B | tB | 1S     | tS     | 1B     | tB     | 1S          | tS    | 1B    | tB    |
| G100p15E   | 58              | 82 | 82 | 82 | 83 | 40.34  | 71.36  | 75.38  | 97.16  | 41.38       | 41.38 | 41.38 | 43.10 |
| G150p20E*  | 86              | 93 | 93 | 93 | 94 | 145.01 | 276.78 | 284.00 | 406.66 | 8.14        | 8.14  | 8.14  | 9.30  |
| Avg.       |                 |    |    |    |    | 91.68  | 175.08 | 180.70 | 251.91 | 24.76       | 25.77 | 25.77 | 26.20 |