

1. Additional Empirical Data

| | | Airport | | | | | | | | | | | | | | | | | | |
|---------------|--|---------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--|--|--|--|--|--|
| | | 6 | 7 | 8 | 9 | 12 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | | | | | | |
| Index | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | | | | | | |
| IsReal? | | 0.68 | 0.68 | 2.22 | 3.24 | 0.99 | 2.42 | 1.94 | 4.52 | 7.48 | 20.42 | 6.81 | 33.91 | 3.99 | | | | | | |
| t_a | | 0.61 | 0.61 | 1.93 | 2.73 | 0.73 | 2.42 | 1.45 | 4.55 | 6.64 | 18.07 | 6.57 | 29.5 | 2.1 | | | | | | |
| t_r | | 21,21,21 | 21,21,21 | 25,26,26 | 25,27,27 | 21,21,21 | 25,26,26 | 22,22,22 | 25,27,27 | 25,28,28 | 25,31,31 | 26,30,30 | 25,32,32 | 53,22,53 | | | | | | |
| l_g, l_a, L | | 79% | 79% | 81% | 76% | 78% | 80% | 76% | 78% | 76% | 75% | 75% | 73% | 39% | | | | | | |
| RelFrac | | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | IS | | | | | | |
| Abs | | | | | | | | | | | | | | | | | | | | |
| | | Blocksworld | | | | | | | | | | | | | | | | | | |
| | | 4 | 5 | 6 | 7 | 8 | | | | | | | | | | | | | | |
| Index | | Y | Y | Y | Y | N | | | | | | | | | | | | | | |
| IsReal? | | 0.07 | 0.57 | 0.69 | 118.25 | 16.01 | | | | | | | | | | | | | | |
| t_a | | 0.07 | 0.55 | 0.73 | 11.15 | 1.4 | | | | | | | | | | | | | | |
| t_r | | 4,6,6 | 10,12,12 | 9,12,12 | 16,20,20 | 9,15,18 | | | | | | | | | | | | | | |
| l_g, l_a, L | | 48% | 73% | 80% | 47% | 32% | | | | | | | | | | | | | | |
| RelFrac | | IS | AS | AS | HM | IS | | | | | | | | | | | | | | |
| Abs | | | | | | | | | | | | | | | | | | | | |
| | | Depots | | | | | | | | | | | | | | | | | | |
| | | 3 | 4 | 7 | 8 | 10 | 11 | 13 | 14 | 15 | 16 | 17 | 19 | 21 | | | | | | |
| Index | | Y | Y | Y | N | Y | N | Y | N | N | Y | Y | Y | N | | | | | | |
| IsReal? | | 73.29 | 429.74 | 10.44 | 228.30 | 47.77 | 49.73 | 9.07 | 118.90 | 56.83 | 13.81 | 18.4 | 460.75 | 342.20 | | | | | | |
| t_a | | 45.77 | 472.01 | 12.25 | 22.52 | 33.11 | 2.13 | 12.42 | 12.72 | 4.45 | 6.54 | 17.41 | - | 55.70 | | | | | | |
| t_r | | 11,12,12 | 12,14,14 | 7,10,10 | 9,13,14 | 8,10,10 | 13,10,? | 9,9,9 | 9,9,? | 10,8,? | 8,8,8 | 6,7,7 | 8,10,10 | 7,7,7 | | | | | | |
| l_g, l_a, L | | 88% | 88% | 77% | 76% | 87% | 27% | 85% | 50% | 20% | 89% | 58% | 92% | 51% | | | | | | |
| RelFrac | | AS | AS | ASnm | AS | ASnm | IS | ASnm | HM | IS | ASnm | ASnm | AS | HM | | | | | | |
| Abs | | | | | | | | | | | | | | | | | | | | |
| | | Dining-Philosophers | | | | | | | | | | | | | | | | | | |
| | | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | | | | | | |
| Index | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | | | | | | |
| IsReal? | | 2.15 | 2.38 | 2.59 | 2.9 | 3.16 | 3.5 | 3.8 | 4.16 | 4.56 | 4.89 | 5.33 | 5.71 | 6.19 | | | | | | |
| t_a | | 1.93 | 2.12 | 2.37 | 2.62 | 2.83 | 3.13 | 3.41 | 3.72 | 4.05 | 4.37 | 4.72 | 5.1 | 5.54 | | | | | | |
| t_r | | 7,11,11 | 7,11,11 | 7,11,11 | 7,11,11 | 7,11,11 | 7,11,11 | 7,11,11 | 7,11,11 | 7,11,11 | 7,11,11 | 7,11,11 | 7,11,11 | 7,11,11 | | | | | | |
| l_g, l_a, L | | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | | | | | | |
| RelFrac | | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | | | | | | |
| Abs | | | | | | | | | | | | | | | | | | | | |
| | | Driverlog | | | | | | | | | | | | | | | | | | |
| | | 2 | 4 | 7 | 8 | 9 | 10 | 11 | 13 | 14 | 15 | 16 | 17 | 18 | | | | | | |
| Index | | N | Y | Y | Y | Y | N | Y | N | N | N | N | N | N | | | | | | |
| IsReal? | | 0.87 | 0.34 | 0.26 | 0.34 | 8.2 | 0.93 | 16.62 | 342.03 | 19.61 | 1.84 | 10.94 | 0.36 | 0.13 | | | | | | |
| t_a | | 0.58 | 0.3 | 0.26 | 0.32 | 4.81 | 0.45 | 10.52 | 113.74 | 2.79 | 1.05 | 0.44 | 0.38 | 0.29 | | | | | | |
| t_r | | 6,9,9 | 5,7,7 | 5,6,6 | 6,7,7 | 7,10,10 | 5,7,7 | 7,9,9 | 9,11,12 | 7,9,11 | 8,8,11 | 8,6,? | 8,4,? | 9,2,? | | | | | | |
| l_g, l_a, L | | 89% | 93% | 92% | 92% | 84% | 70% | 80% | 61% | 63% | 76% | 17% | 15% | 10% | | | | | | |
| RelFrac | | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | AS | ASnm | ASnm | IS | IS | IS | | | | | | |
| Abs | | | | | | | | | | | | | | | | | | | | |

Table 1: Results for SATPLAN'04 and variable domain abstraction in Airport, Blocksworld, Depots, Dining-Philosophers, and Driverlog.

| | | Logistics | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|----------|----------------------|---------|---------|---------|---------|---------|---------|----------|----------|---------|---------|---------------|---------------|----------|---------|---------|---------|---------|---------|---------|---------|----------|----------|---------|--------|---------|
| Index | 10 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 39 | Index | 10 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 39 |
| IsReal? | Y | Y | Y | N | N | N | N | N | N | N | N | N | N | IsReal? | Y | Y | Y | N | N | N | N | N | N | N | N | N | |
| t_a | 0.99 | 91.43 | 25.41 | 70.57 | 111.66 | 150.37 | 770.44 | 684.19 | 820.59 | 615.01 | 929.64 | 965.49 | 1.1 | t_a | 0.99 | 91.43 | 25.41 | 70.57 | 111.66 | 150.37 | 770.44 | 684.19 | 820.59 | 615.01 | 929.64 | 965.49 | 1.1 |
| t_r | 2.14 | 75.28 | 32.87 | 68.12 | 75.79 | 106.61 | 642.97 | 672.25 | 721.73 | 430.95 | 721.82 | 769.36 | 1.9 | t_r | 2.14 | 75.28 | 32.87 | 68.12 | 75.79 | 106.61 | 642.97 | 672.25 | 721.73 | 430.95 | 721.82 | 769.36 | 1.9 |
| l_g, l_a, L | 10,15,15 | 9,13,13 | 9,12,12 | 9,13,13 | 9,13,13 | 9,13,? | 9,15,15 | 9,15,15 | 9,15,15 | 9,14,? | 9,15,? | 9,15,? | 9,8,? | l_g, l_a, L | 10,15,15 | 9,13,13 | 9,12,12 | 9,13,13 | 9,13,13 | 9,13,? | 9,15,15 | 9,15,15 | 9,14,? | 9,15,? | 9,15,? | 9,15,? | 9,8,? |
| RelFrac | 33% | 48% | 48% | 55% | 47% | 44% | 42% | 30% | 33% | 48% | 28% | 43% | 14% | RelFrac | 33% | 48% | 48% | 55% | 47% | 44% | 42% | 30% | 33% | 48% | 28% | 43% | 14% |
| Abs | IS | ASum | ASum | ASum | ASum | ASum | HM | HM | HM | AS | HM | AS | IS | Abs | IS | ASum | ASum | ASum | ASum | ASum | ASum | ASum | ASum | ASum | ASum | IS | |
| | | Pipesworld-Notankage | | | | | | | | | | | | | | | | | | | | | | | | | |
| Index | 10 | 11 | 12 | 13 | 16 | 18 | 19 | 21 | 23 | 24 | 31 | 35 | 41 | Index | 10 | 11 | 12 | 13 | 16 | 18 | 19 | 21 | 23 | 24 | 31 | 35 | 41 |
| IsReal? | N | N | Y | Y | N | N | N | N | Y | Y | N | N | N | IsReal? | N | N | Y | Y | N | N | N | Y | Y | N | N | N | |
| t_a | 37.99 | 95.74 | 521.69 | 85.65 | 129.03 | 62.05 | 162.11 | 6.05 | 303.50 | 304.62 | 509.46 | 308.78 | 34.24 | t_a | 37.99 | 95.74 | 521.69 | 85.65 | 129.03 | 62.05 | 162.11 | 6.05 | 303.50 | 304.62 | 509.46 | 308.78 | 34.24 |
| t_r | 26.51 | 66.02 | 455.53 | 92.9 | 2.97 | 4.82 | 8.08 | 1.96 | 195.85 | 306.56 | 286.07 | 96.25 | 2.83 | t_r | 26.51 | 66.02 | 455.53 | 92.9 | 2.97 | 4.82 | 8.08 | 1.96 | 195.85 | 306.56 | 286.07 | 96.25 | 2.83 |
| l_g, l_a, L | 6,9,? | 7,12,12 | 8,14,14 | 9,12,12 | 14,12,? | 10,10,? | 9,10,? | 9,8,14 | 10,13,13 | 10,13,13 | 8,12,12 | 8,10,? | 6,4,6 | l_g, l_a, L | 6,9,? | 7,12,12 | 8,14,14 | 9,12,12 | 14,12,? | 10,10,? | 9,10,? | 9,8,14 | 10,13,13 | 10,13,13 | 8,12,12 | 8,10,? | 6,4,6 |
| RelFrac | 78% | 62% | 86% | 91% | 32% | 21% | 18% | 48% | 91% | 91% | 80% | 81% | 19% | RelFrac | 78% | 62% | 86% | 91% | 32% | 21% | 18% | 48% | 91% | 91% | 80% | 81% | 19% |
| Abs | IS | ASum | AS | ASum | IS | IS | IS | AS | AS | AS | AS | AS | AS | Abs | IS | ASum | AS | ASum | IS | IS | IS | AS | AS | AS | AS | AS | |
| | | Pipesworld-Tankage | | | | | | | | | | | | | | | | | | | | | | | | | |
| Index | 2 | 5 | 6 | 7 | 8 | 11 | 12 | 13 | 15 | 21 | 22 | 31 | 32 | Index | 2 | 5 | 6 | 7 | 8 | 11 | 12 | 13 | 15 | 21 | 22 | 31 | 32 |
| IsReal? | Y | Y | Y | Y | N | N | N | N | N | N | N | N | N | IsReal? | Y | Y | Y | Y | N | N | N | N | N | N | N | N | |
| t_a | 43.72 | 1.24 | 2.06 | 93.85 | 393.84 | 6.39 | 121.14 | 52.23 | 132.56 | 18.97 | 31.79 | 17.49 | 66.93 | t_a | 43.72 | 1.24 | 2.06 | 93.85 | 393.84 | 6.39 | 121.14 | 52.23 | 132.56 | 18.97 | 31.79 | 17.49 | 66.93 |
| t_r | 42.79 | 1.31 | 2.44 | 67.29 | 143.35 | 1.41 | 62.56 | 4.54 | 5.87 | 0.92 | 0.77 | 1.31 | 7.25 | t_r | 42.79 | 1.31 | 2.44 | 67.29 | 143.35 | 1.41 | 62.56 | 4.54 | 5.87 | 0.92 | 0.77 | 1.31 | 7.25 |
| l_g, l_a, L | 5,10,10 | 5,6,6 | 5,6,6 | 4,6,6 | 5,6,? | 7,7,12 | 8,10,? | 9,6,? | 11,9,? | 9,6,? | 12,8,? | 9,8,? | 8,7,? | l_g, l_a, L | 5,10,10 | 5,6,6 | 5,6,6 | 4,6,6 | 5,6,? | 7,7,12 | 8,10,? | 9,6,? | 11,9,? | 9,6,? | 12,8,? | 9,8,? | 8,7,? |
| RelFrac | 97% | 92% | 94% | 89% | 83% | 36% | 37% | 25% | 28% | 24% | 29% | 32% | 29% | RelFrac | 97% | 92% | 94% | 89% | 83% | 36% | 37% | 25% | 28% | 24% | 29% | 32% | 29% |
| Abs | ASum | ASum | ASum | ASum | AS | IS | IS | IS | IS | IS | IS | IS | IS | Abs | ASum | ASum | ASum | ASum | AS | IS | IS | IS | IS | IS | IS | IS | |
| | | PSR | | | | | | | | | | | | | | | | | | | | | | | | | |
| Index | 16 | 22 | 29 | 31 | 33 | 36 | 37 | 40 | 42 | 47 | 48 | 49 | 50 | Index | 16 | 22 | 29 | 31 | 33 | 36 | 37 | 40 | 42 | 47 | 48 | 49 | 50 |
| IsReal? | N | Y | Y | N | N | Y | Y | N | N | Y | Y | N | Y | IsReal? | N | Y | Y | N | N | Y | Y | N | Y | Y | N | Y | |
| t_a | 0.63 | 64.29 | 11.16 | 1.04 | 0.93 | 2.44 | 2.4 | 0.9 | 0.73 | 17.75 | 125.49 | 3.02 | 0.59 | t_a | 0.63 | 64.29 | 11.16 | 1.04 | 0.93 | 2.44 | 2.4 | 0.9 | 0.73 | 17.75 | 125.49 | 3.02 | 0.59 |
| t_r | 0.8 | 71.86 | 12.05 | 8.38 | 1.33 | 4.96 | 2.26 | 6.39 | 0.87 | 17.41 | 131.94 | 3.11 | 1.03 | t_r | 0.8 | 71.86 | 12.05 | 8.38 | 1.33 | 4.96 | 2.26 | 6.39 | 0.87 | 17.41 | 131.94 | 3.11 | 1.03 |
| l_g, l_a, L | 5,15,15 | 7,25,25 | 7,18,18 | 5,16,16 | 5,16,16 | 8,16,16 | 7,19,19 | 5,14,15 | 5,16,16 | 4,23,23 | 7,26,26 | 8,19,? | 4,16,16 | l_g, l_a, L | 5,15,15 | 7,25,25 | 7,18,18 | 5,16,16 | 5,16,16 | 8,16,16 | 7,19,19 | 5,14,15 | 5,16,16 | 4,23,23 | 7,26,26 | 8,19,? | 4,16,16 |
| RelFrac | 47% | 75% | 79% | 49% | 48% | 90% | 60% | 48% | 53% | 47% | 80% | 37% | 30% | RelFrac | 47% | 75% | 79% | 49% | 48% | 90% | 60% | 48% | 53% | 47% | 80% | 37% | 30% |
| Abs | ASum | ASum | ASum | ASum | ASum | ASum | ASum | ASum | ASum | ASum | ASum | IS | ASum | Abs | ASum | ASum | ASum | ASum | ASum | ASum | ASum | ASum | ASum | ASum | IS | ASum | |
| | | Rovers | | | | | | | | | | | | | | | | | | | | | | | | | |
| Index | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 11 | 12 | 14 | Index | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 11 | 12 | 14 | | |
| IsReal? | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | N | Y | IsReal? | Y | Y | Y | Y | Y | Y | Y | Y | Y | N | Y | | | |
| t_a | 0.28 | 0.19 | 0.27 | 0.2 | 1.56 | 15.34 | 1.04 | 74.57 | 7.96 | 12.29 | 5.54 | 10.37 | t_a | 0.28 | 0.19 | 0.27 | 0.2 | 1.56 | 15.34 | 1.04 | 74.57 | 7.96 | 12.29 | 5.54 | 10.37 | | |
| t_r | 0.28 | 0.19 | 0.27 | 0.2 | 2.78 | 8.56 | 1.03 | 97.79 | 4.47 | 10.34 | 5.15 | 18.35 | t_r | 0.28 | 0.19 | 0.27 | 0.2 | 2.78 | 8.56 | 1.03 | 97.79 | 4.47 | 10.34 | 5.15 | 18.35 | | |
| l_g, l_a, L | 5,6,6 | 4,4,4 | 7,7,7 | 4,4,4 | 5,8,8 | 7,12,12 | 5,7,7 | 5,9,9 | 7,10,10 | 8,11,11 | 5,8,8 | 7,10,10 | l_g, l_a, L | 5,6,6 | 4,4,4 | 7,7,7 | 4,4,4 | 5,8,8 | 7,12,12 | 5,7,7 | 5,9,9 | 7,10,10 | 8,11,11 | 5,8,8 | 7,10,10 | | |
| RelFrac | 82% | 100% | 83% | 87% | 94% | 69% | 86% | 87% | 95% | 94% | 80% | 71% | RelFrac | 82% | 100% | 83% | 87% | 94% | 69% | 86% | 87% | 95% | 94% | 80% | 71% | | |
| Abs | AS | HM | HM | HM | AS | IS | HM | HM | AS | HM | HM | AS | Abs | AS | HM | HM | HM | AS | IS | HM | HM | HM | AS | AS | | | |

Table 2: Results for SATPLAN'04 and variable domain abstraction in Logistics, Pipesworld-Notankage, Pipesworld-Tankage, PSR, and Rovers.

| Satellite | | | | | | | | | | | | | | | | | |
|----------------|---------|---------|-------|--------|-------|--------|--------|---------|---------|--------|--------|--------|--------|--|--|--|--|
| Index | 2 | 4 | 5 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 17 | 18 | | | | |
| <i>IsReal?</i> | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | | | | |
| t_a | 64.43 | 112.30 | 53.06 | 310.76 | 34.35 | 168.03 | 84.47 | 874.84 | 931.17 | 256.16 | 282.79 | 65.79 | 112.50 | | | | |
| t_r | 74.26 | 104.05 | 51.53 | 250.08 | 40.65 | 176.47 | 160.03 | - | - | 425.44 | 429.81 | 152.37 | 217.76 | | | | |
| l_g, l_a, L | 6,12,12 | 6,10,10 | 4,7,7 | 4,8,8 | 4,6,6 | 4,8,8 | 4,8,8 | 6,14,14 | 4,13,13 | 4,8,8 | 4,8,8 | 4,6,6 | 4,8,8 | | | | |
| <i>RelFrac</i> | 37% | 91% | 95% | 90% | 84% | 85% | 74% | 76% | 76% | 78% | 75% | 67% | 74% | | | | |
| <i>Abs</i> | IS | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | | | | |

| Zenotravel | | | | | | | | | | | | | |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|-------|
| Index | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| <i>IsReal?</i> | Y | Y | Y | Y | Y | Y | N | Y | Y | Y | Y | N | N |
| t_a | 0.24 | 0.35 | 0.3 | 0.45 | 0.98 | 0.68 | 3.31 | 66.03 | 97.58 | 86.21 | 222.81 | 338.43 | 0.15 |
| t_r | 0.24 | 0.37 | 0.32 | 0.44 | 1.49 | 1.14 | 0.83 | 82.14 | 74.54 | 101.47 | 233.84 | 244.78 | 0.2 |
| l_g, l_a, L | 5,5,5 | 4,5,5 | 5,5,5 | 5,5,5 | 4,5,5 | 4,6,6 | 4,5,5 | 4,6,6 | 4,6,6 | 4,6,6 | 4,6,6 | 4,7,7 | 4,2,? |
| <i>RelFrac</i> | 68% | 85% | 73% | 80% | 76% | 62% | 75% | 77% | 73% | 68% | 70% | 67% | 20% |
| <i>Abs</i> | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | HM | HM | ASnm | ASnm | HM | HM | IS |

| Mprime | | | | | | | | | | | | | |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Index | 1 | 2 | 3 | 4 | 5 | 7 | 9 | 11 | 12 | 16 | 27 | 28 | 29 |
| <i>IsReal?</i> | Y | N | N | Y | Y | Y | Y | Y | N | N | Y | Y | Y |
| t_a | 0.92 | 4.34 | 0.79 | 2.34 | 6.22 | 1.6 | 3.92 | 1.5 | 1.25 | 2.54 | 2.81 | 1.71 | 2.31 |
| t_r | 0.92 | 0.99 | 0.48 | 2.4 | 5.23 | 1.58 | 3.42 | 1.21 | 0.59 | 1.47 | 2.92 | 1.74 | 2.29 |
| l_g, l_a, L | 5,5,5 | 5,4,5 | 4,3,4 | 7,7,7 | 6,6,6 | 5,5,5 | 5,5,5 | 7,7,7 | 5,4,5 | 4,4,5 | 4,4,4 | 6,7,7 | 4,4,4 |
| <i>RelFrac</i> | 71% | 62% | 32% | 63% | 78% | 45% | 72% | 14% | 68% | 33% | 46% | 87% | 42% |
| <i>Abs</i> | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | IS | ASnm | ASnm | ASnm | ASnm | ASnm |

| Mystery | | | | | | | | | | | | | |
|----------------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|
| Index | 1 | 2 | 3 | 9 | 11 | 19 | 20 | 25 | 26 | 27 | 28 | 29 | 30 |
| <i>IsReal?</i> | Y | N | N | N | Y | N | Y | Y | N | Y | Y | Y | N |
| t_a | 0.21 | 3.96 | 0.22 | 2.35 | 0.21 | 10.52 | 180.66 | 0.2 | 0.6 | 0.42 | 0.12 | 0.63 | 6.43 |
| t_r | 0.22 | 0.81 | 0.26 | 0.81 | 0.21 | 1.92 | 112.42 | 0.21 | 0.36 | 0.54 | 0.14 | 0.59 | 2.11 |
| l_g, l_a, L | 5,5,5 | 5,4,5 | 4,2,4 | 5,5,5 | 7,7,7 | 6,5,6 | 7,7,7 | 4,4,4 | 6,4,6 | 4,4,4 | 6,7,7 | 4,4,4 | 6,6,6 |
| <i>RelFrac</i> | 53% | 60% | 17% | 66% | 17% | 47% | 76% | 74% | 58% | 44% | 24% | 34% | 56% |
| <i>Abs</i> | ASnm | ASnm | ASnm | ASnm | IS | ASnm | AS | ASnm | ASnm | ASnm | IS | ASnm | ASnm |

| Optical-Telegraph | | | | | | | | | | | | | |
|-------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Index | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| <i>IsReal?</i> | N | N | N | N | N | N | N | N | N | N | N | N | N |
| t_a | 0.86 | 1.58 | 2.68 | 3.86 | 5.86 | 8.1 | 10.97 | 14.11 | 18.79 | 23.4 | 28.8 | 35.99 | 43.61 |
| t_r | 0.71 | 1.22 | 1.96 | 2.98 | 4.36 | 6.14 | 8.17 | 10.77 | 13.98 | 17.17 | 21.59 | 26.31 | 31.98 |
| l_g, l_a, L | 11,13,13 | 11,13,13 | 11,13,13 | 11,13,13 | 11,13,13 | 11,13,13 | 11,13,13 | 11,13,13 | 11,13,13 | 11,13,13 | 11,13,13 | 11,13,13 | 11,13,13 |
| <i>RelFrac</i> | 53% | 53% | 53% | 53% | 53% | 53% | 53% | 53% | 53% | 53% | 53% | 53% | 53% |
| <i>Abs</i> | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm | ASnm |

Table 3: Results for SATPLAN'04 and variable domain abstraction in Satellite, Zenotravel, Mprime, Mystery, and Optical-Telegraph.

| Airport | | | | | | | | | |
|---------------------|---------|----------|----------|----------|----------|----------|----------|----------|---------|
| Index | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 10 |
| IsReal? | Y | N | Y | Y | Y | Y | Y | Y | N |
| t_a | 0.0 | 0.01 | 0.01 | 0.03 | 0.03 | 0.07 | 0.07 | 67.89 | 0.02 |
| t_r | 0.0 | 0.0 | 0.01 | 0.03 | 0.03 | 0.08 | 0.08 | 0.27 | 0.03 |
| l_g, l_a, L | 8,8,8 | 9,9,9 | 9,9,9 | 20,20,20 | 21,21,21 | 21,21,21 | 21,21,21 | 25,26,26 | 18,9,18 |
| RelFrac | 73% | 64% | 82% | 62% | 60% | 79% | 79% | 77% | 51% |
| Abs | AS | AS | AS | AS | AS | AS | AS | AS | AS |
| Blocksworld | | | | | | | | | |
| Index | 4 | 5 | 6 | 7 | | | | | |
| IsReal? | Y | Y | Y | Y | | | | | |
| t_a | 0.00 | 0.0 | 0.01 | 3.09 | | | | | |
| t_r | 0.00 | 0.01 | 0.01 | 0.01 | | | | | |
| l_g, l_a, L | 4,6,6 | 10,12,12 | 9,12,12 | 16,20,20 | | | | | |
| RelFrac | 55% | 73% | 50% | 47% | | | | | |
| Abs | HM | AS | HM | HM | | | | | |
| Depots | | | | | | | | | |
| Index | 1 | 2 | 3 | 4 | 7 | 10 | 13 | 16 | 17 |
| IsReal? | Y | Y | Y | Y | N | Y | Y | Y | Y |
| t_a | 0.00 | 0.02 | 0.2 | 5.68 | 3.03 | 1.32 | 0.72 | 0.89 | 254.43 |
| t_r | 0.01 | 0.02 | 0.16 | 0.2 | 0.06 | 0.9 | 0.74 | 0.93 | 268.42 |
| l_g, l_a, L | 5,5,5 | 7,8,8 | 11,12,12 | 12,14,14 | 7,9,10 | 8,10,10 | 9,9,9 | 8,8,8 | 6,7,7 |
| RelFrac | 90% | 81% | 88% | 88% | 75% | 85% | 85% | 80% | 58% |
| Abs | HM | HM | AS | AS | HM | AS | AS | AS | AS |
| Dining-Philosophers | | | | | | | | | |
| Index | 1 | 2 | 3 | 4 | 5 | | | | |
| IsReal? | Y | Y | Y | Y | Y | | | | |
| t_a | 0.01 | 0.05 | 0.6 | 9.88 | 170.45 | | | | |
| t_r | 0.01 | 0.04 | 0.56 | 8.73 | 138.03 | | | | |
| l_g, l_a, L | 7,11,11 | 7,11,11 | 7,11,11 | 7,11,11 | 7,11,11 | | | | |
| RelFrac | 71% | 71% | 71% | 71% | 71% | | | | |
| Abs | AS | AS | AS | AS | AS | | | | |
| Driverlog | | | | | | | | | |
| Index | 1 | 2 | 3 | 4 | 6 | 7 | 8 | 9 | |
| IsReal? | N | N | Y | Y | N | Y | Y | N | |
| t_a | 0.0 | 0.04 | 0.01 | 0.1 | 0.01 | 0.06 | 0.61 | 1.11 | |
| t_r | 0.0 | 0.02 | 0.01 | 0.06 | 0.01 | 0.05 | 0.54 | 0.7 | |
| l_g, l_a, L | 6,3,6 | 6,9,9 | 6,7,7 | 5,7,7 | 4,3,6 | 5,6,6 | 6,7,7 | 7,10,10 | |
| RelFrac | 68% | 89% | 77% | 93% | 50% | 92% | 88% | 84% | |
| Abs | AS | AS | AS | AS | AS | AS | AS | AS | |

Table 4: Results for IPP and variable domain abstraction in Airport, Blocksworld, Depots, Dining-Philosophers, and Driverlog.

| Logistics | | | | | | | | | | |
|-----------------------------|-------|---------|-------|----------|---------|----------|-------|-------|-------|-------|
| Index | 4 | 5 | 6 | 7 | 8 | 9 | | | | |
| <i>IsReal?</i> | Y | Y | Y | Y | Y | Y | | | | |
| t_a | 0.00 | 0.00 | 0.00 | 0.57 | 0.17 | 0.04 | | | | |
| t_r | 0.00 | 0.00 | 0.00 | 0.43 | 0.95 | 0.12 | | | | |
| l_g, l_a, L | 9,9,9 | 9,9,9 | 9,9,9 | 10,12,12 | 9,11,11 | 10,11,11 | | | | |
| <i>RelFrac</i> | 54% | 77% | 83% | 55% | 49% | 56% | | | | |
| <i>Abs</i> | HM | HM | HM | AS | HM | HM | | | | |
| Pipesworld-Notankage | | | | | | | | | | |
| Index | 1 | 2 | 5 | 6 | 7 | 8 | | | | |
| <i>IsReal?</i> | Y | Y | Y | Y | N | N | | | | |
| t_a | 0.0 | 0.01 | 0.06 | 0.06 | 0.08 | 0.25 | | | | |
| t_r | 0.0 | 0.01 | 0.06 | 0.06 | 0.04 | 0.05 | | | | |
| l_g, l_a, L | 3,3,3 | 5,6,6 | 4,6,6 | 4,6,6 | 4,5,6 | 5,5,7 | | | | |
| <i>RelFrac</i> | 76% | 90% | 88% | 88% | 72% | 73% | | | | |
| <i>Abs</i> | AS | AS | AS | AS | AS | AS | | | | |
| Pipesworld-Tankage | | | | | | | | | | |
| Index | 1 | 2 | 5 | 6 | 7 | | | | | |
| <i>IsReal?</i> | Y | Y | Y | Y | N | | | | | |
| t_a | 0.01 | 0.02 | 0.15 | 0.21 | 32.16 | | | | | |
| t_r | 0.01 | 0.02 | 0.15 | 0.2 | 0.64 | | | | | |
| l_g, l_a, L | 3,3,3 | 5,10,10 | 5,6,6 | 5,6,6 | 4,5,6 | | | | | |
| <i>RelFrac</i> | 77% | 94% | 88% | 88% | 82% | | | | | |
| <i>Abs</i> | AS | AS | AS | AS | AS | | | | | |
| PSR | | | | | | | | | | |
| Index | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| <i>IsReal?</i> | N | N | N | N | N | N | N | N | N | N |
| t_a | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| t_r | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.01 |
| l_g, l_a, L | 3,3,8 | 3,3,8 | 3,3,8 | 3,3,8 | 3,3,8 | 3,3,8 | 3,3,8 | 3,3,8 | 3,3,8 | 5,4,5 |
| <i>RelFrac</i> | 41% | 22% | 27% | 36% | 28% | 25% | 26% | 45% | 35% | 37% |
| <i>Abs</i> | AS | AS | AS | AS | AS | AS | AS | AS | AS | AS |
| Rovers | | | | | | | | | | |
| Index | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 12 | | |
| <i>IsReal?</i> | Y | Y | Y | Y | Y | N | Y | N | | |
| t_a | 0.00 | 0.01 | 0.01 | 0.01 | 1.7 | 592.55 | 0.06 | 13.02 | | |
| t_r | 0.00 | 0.00 | 0.01 | 0.01 | 1.04 | 375.72 | 0.06 | 3.07 | | |
| l_g, l_a, L | 5,6,6 | 4,4,4 | 7,7,7 | 4,4,4 | 5,8,8 | 7,12,12 | 5,7,7 | 5,8,8 | | |
| <i>RelFrac</i> | 65% | 100% | 83% | 87% | 94% | 90% | 87% | 80% | | |
| <i>Abs</i> | HM | HM | HM | HM | AS | HM | AS | HM | | |

Table 5: Results for IPP and variable domain abstraction in Logistics, Pipesworld-Notankage, Pipesworld-Tankage, PSR, and Rovers.

| Satellite | | | | | | | | | | | | |
|-------------------|----------|----------|-------|---------|--------|-------|---------|-------|-------|-------|-------|--------|
| Index | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | | | |
| IsReal? | Y | Y | Y | Y | Y | Y | Y | | | | | |
| t_a | 0.00 | 0.02 | 0.01 | 2.10 | 65.34 | 1.40 | 100.26 | | | | | |
| t_r | 0.00 | 0.02 | 0.02 | 3.99 | 463.01 | 26.66 | 2010.66 | | | | | |
| l_g, l_a, L | 6,8,8 | 6,12,12 | 4,6,6 | 6,10,10 | 4,7,7 | 6,8,8 | 4,6,6 | | | | | |
| RelFrac | 82% | 97% | 90% | 91% | 95% | 81% | 87% | | | | | |
| Abs | HM | HM | HM | HM | HM | HM | HM | | | | | |
| Zenotravel | | | | | | | | | | | | |
| Index | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| IsReal? | Y | Y | Y | Y | N | Y | Y | N | Y | Y | Y | Y |
| t_a | 0.0 | 0.01 | 0.02 | 0.01 | 0.03 | 0.03 | 0.04 | 0.13 | 0.38 | 10.58 | 18.52 | 344.29 |
| t_r | 0.0 | 0.01 | 0.01 | 0.02 | 0.03 | 0.03 | 0.06 | 0.10 | 2.43 | 3.71 | 52.53 | 322.41 |
| l_g, l_a, L | 1,1,1 | 5,5,5 | 4,5,5 | 5,5,5 | 5,5,5 | 4,5,5 | 4,6,6 | 4,5,5 | 4,6,6 | 4,6,6 | 4,6,6 | 4,6,6 |
| RelFrac | 33% | 72% | 85% | 60% | 82% | 76% | 74% | 75% | 77% | 73% | 66% | 67% |
| Abs | AS | HM | AS | AS | HM | AS | HM | HM | HM | AS | HM | AS |
| Mprime | | | | | | | | | | | | |
| Index | 1 | 2 | 3 | 4 | 5 | 7 | 9 | | | | | |
| IsReal? | Y | N | N | Y | Y | Y | Y | | | | | |
| t_a | 0.09 | 0.56 | 0.2 | 0.15 | 0.57 | 0.22 | 0.36 | | | | | |
| t_r | 0.1 | 0.98 | 0.43 | 0.19 | 0.63 | 0.31 | 0.35 | | | | | |
| l_g, l_a, L | 5,5,5 | 5,4,5 | 4,3,4 | 7,7,7 | 6,6,6 | 5,5,5 | 5,5,5 | | | | | |
| RelFrac | 71% | 62% | 32% | 63% | 78% | 45% | 72% | | | | | |
| Abs | AS | AS | AS | AS | AS | AS | AS | | | | | |
| Mystery | | | | | | | | | | | | |
| Index | 1 | 2 | 3 | | | | | | | | | |
| IsReal? | Y | N | N | | | | | | | | | |
| t_a | 0.01 | 0.38 | 0.02 | | | | | | | | | |
| t_r | 0.01 | 0.68 | 0.1 | | | | | | | | | |
| l_g, l_a, L | 5,5,5 | 5,4,5 | 4,2,4 | | | | | | | | | |
| RelFrac | 53% | 60% | 17% | | | | | | | | | |
| Abs | AS | AS | AS | | | | | | | | | |
| Optical-Telegraph | | | | | | | | | | | | |
| Index | 1 | 2 | | | | | | | | | | |
| IsReal? | N | N | | | | | | | | | | |
| t_a | 0.18 | 15.73 | | | | | | | | | | |
| t_r | 0.13 | 5.22 | | | | | | | | | | |
| l_g, l_a, L | 11,13,13 | 11,13,13 | | | | | | | | | | |
| RelFrac | 53% | 53% | | | | | | | | | | |
| Abs | AS | AS | | | | | | | | | | |

Table 6: Results for IPP and variable domain abstraction in Satellite, Zenotravel, Mprime, Mystery, and Optical-Telegraph.

| | | Depots | | | | | | | | | |
|------------------|--|---------|---------|---------|----------|---------|----------|----------|----------|----------|---------|
| Index | | 1 | 2 | | | | | | | | |
| IsReal? | | Y | Y | | | | | | | | |
| t_a | | 0.3 | 1.1 | | | | | | | | |
| t_r | | 0.3 | - | | | | | | | | |
| l_g, l_a, L | | 5,10,10 | 7,15,15 | | | | | | | | |
| RelFrac | | 90% | 81% | | | | | | | | |
| Abs | | HM | HM | | | | | | | | |
| Driverlog | | | | | | | | | | | |
| Index | | 1 | 2 | 3 | 6 | 7 | 8 | 10 | | | |
| IsReal? | | N | Y | Y | N | Y | Y | Y | Y | Y | |
| t_a | | 0.36 | 0.49 | 0.46 | 0.71 | 3.36 | 967.05 | 503.15 | | | |
| t_r | | 0.32 | 0.51 | 0.59 | 0.55 | 3.57 | 656.71 | - | | | |
| l_g, l_a, L | | 6,4,7 | 6,19,19 | 6,12,12 | 4,8,11 | 5,13,13 | 6,22,22 | 5,17,17 | | | |
| RelFrac | | 68% | 89% | 77% | 50% | 92% | 88% | 70% | | | |
| Abs | | AS | AS | AS | AS | AS | AS | AS | AS | AS | |
| Logistics | | | | | | | | | | | |
| Index | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| IsReal? | | Y | Y | Y | Y | Y | Y | Y | Y | Y | |
| t_a | | 0.26 | 0.28 | 0.29 | 0.6 | 0.57 | 0.76 | 2.33 | 7.33 | 7.23 | |
| t_r | | 0.3 | 0.31 | 0.31 | 3.47 | 2.0 | 4.1 | - | - | - | |
| l_g, l_a, L | | 9,20,20 | 9,27,27 | 9,25,25 | 10,36,36 | 9,31,31 | 10,36,36 | 10,45,45 | 10,48,48 | 10,42,42 | |
| RelFrac | | 54% | 77% | 83% | 54% | 49% | 56% | 36% | 43% | 42% | |
| Abs | | HM | HM | HM | HM | HM | HM | HM | HM | HM | |
| PSR | | | | | | | | | | | |
| Index | | 15 | 22 | 25 | 29 | 31 | 35 | 36 | 37 | 40 | 48 |
| IsReal? | | N | N | Y | N | N | N | Y | N | N | N |
| t_a | | 0.44 | 0.51 | 0.67 | 0.55 | 0.58 | 0.60 | 1.54 | 0.42 | 0.79 | 7.54 |
| t_r | | 0.93 | 0.59 | 13.46 | 0.69 | 1.22 | 0.56 | 1.91 | 0.53 | 1.35 | 4.73 |
| l_g, l_a, L | | 4,9,10 | 7,32,33 | 4,9,9 | 7,18,21 | 5,17,19 | 5,18,22 | 8,22,22 | 7,22,23 | 5,17,20 | 7,36,37 |
| RelFrac | | 47% | 55% | 37% | 41% | 49% | 47% | 90% | 49% | 48% | 58% |
| Abs | | AS | AS | AS | AS | AS | AS | AS | AS | AS | AS |
| Rovers | | | | | | | | | | | |
| Index | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | |
| IsReal? | | Y | Y | Y | Y | Y | Y | Y | | | |
| t_a | | 0.15 | 0.14 | 0.19 | 0.2 | 200.6 | 29.48 | 142.6 | | | |
| t_r | | 0.16 | 0.14 | 0.22 | 0.23 | 28.1 | 189.56 | 340.56 | | | |
| l_g, l_a, L | | 5,10,10 | 4,8,8 | 7,11,11 | 4,8,8 | 5,22,22 | 7,36,36 | 5,18,18 | | | |
| RelFrac | | 65% | 100% | 83% | 87% | 94% | 90% | 86% | | | |
| Abs | | HM | HM | HM | HM | AS | HM | HM | HM | HM | HM |

Table 7: Results for Mips.BDD and variable domain abstraction in Depots, Driverlog, Logistics, PSR, and Rovers.

| | | Zenotravel | | | | | | | | | | |
|-------------------|---------|-------------------|-------|-------|---------|---------|---------|---------|--------|---------|----|----|
| Index | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 11 | | |
| IsReal? | Y | Y | Y | Y | Y | Y | Y | Y | N | Y | N | Y |
| t_a | 0.30 | 0.34 | 0.44 | 0.44 | 0.60 | 1.40 | 0.93 | 4.35 | 693.44 | 271.01 | - | - |
| t_r | 0.31 | 0.33 | 0.44 | 0.49 | 0.68 | 2.10 | 2.15 | 19.91 | - | - | - | - |
| l_g, l_{a_i}, L | 1,1,1 | 5,6,6 | 4,6,6 | 5,8,8 | 5,11,11 | 4,11,11 | 4,15,15 | 4,11,11 | 4,20,? | 4,14,14 | - | - |
| RelFrac | 33% | 72% | 82% | 60% | 82% | 78% | 74% | 75% | 60% | 66% | - | - |
| Abs | AS | HM | HM | AS | HM | HM | HM | HM | AS | HM | AS | HM |
| Grid | | | | | | | | | | | | |
| Index | 1 | | | | | | | | | | | |
| IsReal? | N | | | | | | | | | | | |
| t_a | 1.82 | | | | | | | | | | | |
| t_r | - | | | | | | | | | | | |
| l_g, l_{a_i}, L | 14,7,14 | | | | | | | | | | | |
| RelFrac | 43% | | | | | | | | | | | |
| Abs | AS | | | | | | | | | | | |

Table 8: Results for Mips.BDD and variable domain abstraction in Zenotravel, Grid.