

**Table S5.** Columns 2, 3, and 4 show confidence intervals for the average of the sum of self-writhes ( $\mathcal{S}_{200}(L++)$ ), and self-writhes of components 1 and 2 ( $\mathcal{S}_{200}(L++,1)$  and  $\mathcal{S}_{200}(L++,2)$ ) for length 200 links in  $\mathbb{Z}^3$ . For each 2-component link indicated in column 1, the average is taken over an ensemble of statistically independent length 200 lattice links of type L as described in section 6. Combined with the linking number (column 7), these confidence intervals are used to determine which diagram appears as L++ in table A1 with small ambiguities for  $9_5^2, 9_{34}^2, 9_{35}^2, 9_{39}^2$ , and  $9_{41}^2$ . The Rolfsen diagram's designation in our nomenclature (as described in 3.2) is presented in column 5 [2]. Column 6 lists which isotopy class is represented by default in KnotPlot [23]. Note that the KnotPlot conformations are reflections of the Rolfsen Table. Symmetry groups (column 8) are taken from the work of *Henry & Weeks, Berglund et al.*, and from SnapPy [15,16,26].

| L          | $\mathcal{S}_{200}(L++)$ | $\mathcal{S}_{200}(L++,1)$ | $\mathcal{S}_{200}(L++,2)$ | Rolfsen       | KP                   | lk(L) | Sym            |
|------------|--------------------------|----------------------------|----------------------------|---------------|----------------------|-------|----------------|
| $0_1^2$    | [- -]                    | [- -]                      | [- -]                      | $0_1^2$       | $0_1^2++$            | 0     | $\Gamma_2$     |
| $2_1^2$    | [-0.037 0.102]           | [-0.054 0.043]             | [-0.106 0.087]             | $2_1^2$       | $2_1^2++$            | 1     | $\Sigma_{8,2}$ |
| $4_1^2$    | [0.755 0.877]            | [0.391 0.481]              | [0.336 0.424]              | $4_1^{2*}$    | $4_1^2+-$            | 2     | $\Sigma_{4,1}$ |
| $5_1^2$    | [1.401 1.607]            | [0.685 0.844]              | [0.657 0.822]              | $5_1^{2*}$    | $5_1^2++$            | 0     | $\Sigma_{8,1}$ |
| $6_1^2$    | [1.624 1.692]            | [0.812 0.862]              | [0.795 0.847]              | $6_1^{2*}$    | $6_1^2++$            | 3     | $\Sigma_{4,1}$ |
| $6_2^2$    | [-0.156 0.042]           | [-0.144 0.014]             | [-0.067 0.083]             | $6_2^2$       | $6_2^2++$            | 3     | $\Sigma_{8,2}$ |
| $6_3^2$    | [1.957 2.225]            | [0.979 1.207]              | [0.892 1.105]              | $6_3^{2*}$    | $6_3^2+-$            | 2     | $\Sigma_{4,1}$ |
| $7_1^2$    | [2.188 2.364]            | [1.027 1.167]              | [1.109 1.249]              | $7_1^{2*}$    | $7_1^2++$            | 1     | $\Sigma_{4,1}$ |
| $7_2^2$    | [0.413 0.788]            | [0.211 0.509]              | [0.093 0.389]              | $7_2^{2*}$    | $7_2^2+-$            | 1     | $\Sigma_{4,1}$ |
| $7_3^2$    | [2.667 2.728]            | [1.318 1.373]              | [1.324 1.38]               | $7_3^{2*}$    | $7_3^2++$            | 0     | $\Sigma_{8,1}$ |
| $7_4^2$    | [4.292 4.348]            | [3.992 4.04]               | [0.289 0.319]              | $7_4^2$       | $7_4^{2*}++$         | 0     | $\Sigma_{4,2}$ |
| $7_5^2$    | [2.532 2.602]            | [2.843 2.904]              | [-0.326 - 0.286]           | $7_5^{2*}$    | $\tau 7_5^2++$       | 2     | $\Sigma_{2,1}$ |
| $7_6^2$    | [1.411 1.445]            | [1.381 1.41]               | [0.023 0.042]              | $7_6^{2*}$    | $\tau 7_6^2++$       | 0     | $\Sigma_{4,2}$ |
| $7_7^2$    | [3.51 3.592]             | [3.458 3.527]              | [0.036 0.081]              | $7_7^2$       | $7_7^{2*}++$         | 2     | $\Sigma_{2,1}$ |
| $7_8^2$    | [3.248 3.324]            | [3.304 3.368]              | [-0.07 - 0.03]             | $7_8^{2*}$    | $\tau 7_8^2++$       | 0     | $\Sigma_{4,2}$ |
| $8_1^2$    | [2.443 2.477]            | [1.225 1.251]              | [1.209 1.235]              | $8_1^{2*}$    | $8_1^2+-$            | 4     | $\Sigma_{4,1}$ |
| $8_2^2$    | [0.761 0.79]             | [0.373 0.396]              | [0.379 0.403]              | $8_2^2$       | $8_2^{2*}++$         | 4     | $\Sigma_{4,1}$ |
| $8_3^2$    | [2.861 2.907]            | [1.435 1.474]              | [1.41 1.449]               | $8_3^{2*}$    | $8_3^2++$            | 3     | $\Sigma_{4,1}$ |
| $8_4^2$    | [0.868 0.94]             | [0.417 0.476]              | [0.429 0.486]              | $8_4^{2*}$    | $8_4^2+-$            | 4     | $\Sigma_{4,1}$ |
| $8_5^2$    | [1.171 1.22]             | [0.575 0.618]              | [0.578 0.62]               | $8_5^{2*}$    | $8_5^2++$            | 3     | $\Sigma_{4,1}$ |
| $8_6^2$    | [3.29 3.33]              | [1.632 1.671]              | [1.639 1.678]              | $8_6^{2*}$    | $8_6^2++$            | 2     | $\Sigma_{4,1}$ |
| $8_7^2$    | [2.829 2.864]            | [1.415 1.445]              | [1.402 1.431]              | $8_7^{2*}$    | $8_7^2+-$            | 1     | $\Sigma_{4,1}$ |
| $8_8^2$    | [-0.002 0.033]           | [0.006 0.035]              | [-0.02 0.01]               | $8_8^2$       | $8_8^2++$            | 1     | $\Sigma_{8,2}$ |
| $8_9^2$    | [0.777 0.92]             | [0.471 0.599]              | [0.276 0.35]               | $8_9^2$       | $\tau 8_9^{2*}++$    | 2     | $\Sigma_{2,1}$ |
| $8_{10}^2$ | [0.893 0.927]            | [0.594 0.625]              | [0.291 0.309]              | $8_{10}^2$    | $8_{10}^{2*}++$      | 0     | $\Sigma_{4,2}$ |
| $8_{11}^2$ | [4.944 4.98]             | [4.423 4.455]              | [0.512 0.534]              | $8_{11}^2$    | $8_{11}^{2*}++$      | 2     | $\Sigma_{2,1}$ |
| $8_{12}^2$ | [1.904 1.932]            | [2.422 2.447]              | [-0.526 - 0.508]           | $8_{12}^{2*}$ | $8_{12}^2++$         | 0     | $\Sigma_{4,2}$ |
| $8_{13}^2$ | [1.945 2.0]              | [1.917 1.965]              | [0.018 0.046]              | $8_{13}^{2*}$ | $8_{13}^2++$         | 0     | $\Sigma_{4,2}$ |
| $8_{14}^2$ | [3.13 3.185]             | [3.17 3.218]               | [-0.051 - 0.022]           | $8_{14}^2$    | $8_{14}^{2*}++$      | 2     | $\Sigma_{2,1}$ |
| $8_{15}^2$ | [0.029 0.056]            | [0.034 0.048]              | [-0.01 0.014]              | $8_{15}^2$    | $\tau 8_{15}^{2*}++$ | 0     | $\Sigma_{4,2}$ |
| $8_{16}^2$ | [0.188 0.219]            | [0.132 0.16]               | [0.05 0.065]               | $8_{16}^2$    | $8_{16}^{2*}++$      | 2     | $\Sigma_{2,1}$ |
| $9_1^2$    | [3.001 3.069]            | [1.504 1.559]              | [1.476 1.531]              | $9_1^{2*}$    | $9_1^2+-$            | 2     | $\Sigma_{4,1}$ |
| $9_2^2$    | [0.188 0.235]            | [0.082 0.12]               | [0.091 0.13]               | $9_2^2$       | $9_2^{2*}+-$         | 2     | $\Sigma_{4,1}$ |
| $9_3^2$    | [3.473 3.506]            | [1.727 1.758]              | [1.731 1.762]              | $9_3^{2*}$    | $9_3^2+-$            | 1     | $\Sigma_{4,1}$ |
| $9_4^2$    | [3.074 3.111]            | [1.535 1.565]              | [1.527 1.558]              | $9_4^{2*}$    | $9_4^2++$            | 0     | $\Sigma_{8,1}$ |
| $9_5^2$    | [1.359 1.462]            | [0.666 0.751]              | [0.659 0.745]              | $9_5^2$       | $9_5^{2*}++$         | 0     | $\Sigma_{4,1}$ |
| $9_6^2$    | [1.347 1.37]             | [0.673 0.692]              | [0.666 0.685]              | $9_6^{2*}$    | $9_6^2+-$            | 2     | $\Sigma_{4,1}$ |
| $9_7^2$    | [1.475 1.511]            | [0.73 0.76]                | [0.733 0.763]              | $9_7^{2*}$    | $9_7^2+-$            | 2     | $\Sigma_{4,1}$ |

| L          | $\mathcal{S}_{200}(L++)$ | $\mathcal{S}_{200}(L++, 1)$ | $\mathcal{S}_{200}(L++, 2)$ | Rolfesen      | KP                    | lk(L) | Sym            |
|------------|--------------------------|-----------------------------|-----------------------------|---------------|-----------------------|-------|----------------|
| $9_8^2$    | [1.781 1.831]            | [0.865 0.912]               | [0.894 0.941]               | $9_8^{2*}$    | $9_8^{2+-}$           | 1     | $\Sigma_{4,1}$ |
| $9_9^2$    | [0.279 0.324]            | [0.133 0.17]                | [0.131 0.169]               | $9_9^{2*}$    | $9_9^{2++}$           | 0     | $\Sigma_{8,1}$ |
| $9_{10}^2$ | [3.861 3.932]            | [1.897 1.973]               | [1.923 1.999]               | $9_{10}^{2*}$ | $9_{10}^{2++}$        | 0     | $\Sigma_{8,1}$ |
| $9_{11}^2$ | [3.432 3.53]             | [1.708 1.798]               | [1.683 1.774]               | $9_{11}^{2*}$ | $9_{11}^{2+-}$        | 1     | $\Sigma_{4,1}$ |
| $9_{12}^2$ | [0.591 0.616]            | [0.306 0.337]               | [0.277 0.308]               | $9_{12}^{2*}$ | $9_{12}^{2*++}$       | 1     | $\Sigma_{4,1}$ |
| $9_{13}^2$ | [7.056 7.092]            | [6.737 6.769]               | [0.312 0.329]               | $9_{13}^{2*}$ | $9_{13}^{2*++}$       | 0     | $\Sigma_{4,2}$ |
| $9_{14}^2$ | [5.336 5.36]             | [5.657 5.679]               | [-0.326 -0.314]             | $9_{14}^{2*}$ | $\tau 9_{14}^{2*++}$  | 2     | $\Sigma_{2,1}$ |
| $9_{15}^2$ | [5.399 5.415]            | [5.102 5.116]               | [0.294 0.302]               | $9_{15}^{2*}$ | $\tau 9_{15}^{2*+++}$ | 0     | $\Sigma_{4,2}$ |
| $9_{16}^2$ | [3.635 3.67]             | [3.947 3.978]               | [-0.319 -0.302]             | $9_{16}^{2*}$ | $\tau 9_{16}^{2*++}$  | 2     | $\Sigma_{2,1}$ |
| $9_{17}^2$ | [3.784 3.809]            | [4.092 4.115]               | [-0.313 -0.301]             | $9_{17}^{2*}$ | $\tau 9_{17}^{2*++}$  | 2     | $\Sigma_{2,1}$ |
| $9_{18}^2$ | [5.527 5.562]            | [5.21 5.241]                | [0.31 0.328]                | $9_{18}^{2*}$ | $\tau 9_{18}^{2*+++}$ | 0     | $\Sigma_{4,2}$ |
| $9_{19}^2$ | [5.089 5.106]            | [4.395 4.408]               | [0.691 0.701]               | $9_{19}^{2*}$ | $\tau 9_{19}^{2*+++}$ | 1     | $\Sigma_{2,1}$ |
| $9_{20}^2$ | [1.746 1.769]            | [2.447 2.467]               | [-0.706 -0.692]             | $9_{20}^{2*}$ | $\tau 9_{20}^{2*++}$  | 3     | $\Sigma_{2,1}$ |
| $9_{21}^2$ | [3.434 3.456]            | [3.576 3.595]               | [-0.148 -0.133]             | $9_{21}^{2*}$ | $\tau 9_{21}^{2*+++}$ | 1     | $\Sigma_{2,1}$ |
| $9_{22}^2$ | [3.396 3.493]            | [3.267 3.352]               | [0.105 0.165]               | $9_{22}^{2*}$ | $\tau 9_{22}^{2*+-}$  | 3     | $\Sigma_{2,1}$ |
| $9_{23}^2$ | [0.236 0.271]            | [0.105 0.134]               | [0.119 0.148]               | $9_{23}^{2*}$ | $9_{23}^{2*+++}$      | 2     | $\Sigma_{4,1}$ |
| $9_{24}^2$ | [3.457 3.482]            | [1.718 1.74]                | [1.73 1.751]                | $9_{24}^{2*}$ | $9_{24}^{2*++}$       | 3     | $\Sigma_{4,1}$ |
| $9_{25}^2$ | [1.472 1.507]            | [0.947 0.979]               | [0.517 0.537]               | $9_{25}^{2*}$ | $9_{25}^{2*+++}$      | 0     | $\Sigma_{4,2}$ |
| $9_{26}^2$ | [1.552 1.576]            | [1.027 1.049]               | [0.518 0.533]               | $9_{26}^{2*}$ | $9_{26}^{2*+++}$      | 2     | $\Sigma_{2,1}$ |
| $9_{27}^2$ | [5.586 5.628]            | [4.847 4.887]               | [0.726 0.755]               | $9_{27}^{2*}$ | $9_{27}^{2*+++}$      | 0     | $\Sigma_{4,2}$ |
| $9_{28}^2$ | [1.263 1.283]            | [1.993 2.012]               | [-0.736 -0.722]             | $9_{28}^{2*}$ | $9_{28}^{2*++}$       | 2     | $\Sigma_{2,1}$ |
| $9_{29}^2$ | [5.392 5.42]             | [5.695 5.721]               | [-0.309 -0.295]             | $9_{29}^{2*}$ | $9_{29}^{2*+-}$       | 2     | $\Sigma_{2,1}$ |
| $9_{30}^2$ | [5.447 5.507]            | [5.149 5.203]               | [0.286 0.316]               | $9_{30}^{2*}$ | $9_{30}^{2*+-}$       | 2     | $\Sigma_{2,1}$ |
| $9_{31}^2$ | [4.183 4.213]            | [4.134 4.161]               | [0.043 0.058]               | $9_{31}^{2*}$ | $9_{31}^{2*++}$       | 0     | $\Sigma_{4,2}$ |
| $9_{32}^2$ | [2.474 2.597]            | [2.452 2.561]               | [-0.0 0.058]                | $9_{32}^{2*}$ | $9_{32}^{2*++}$       | 0     | $\Sigma_{4,2}$ |
| $9_{33}^2$ | [2.673 2.703]            | [2.715 2.741]               | [-0.047 -0.033]             | $9_{33}^{2*}$ | $9_{33}^{2*+++}$      | 0     | $\Sigma_{4,2}$ |
| $9_{34}^2$ | [0.571 0.614]            | [0.936 0.972]               | [-0.375 -0.348]             | $9_{34}^{2*}$ | $9_{34}^{2*+++}$      | 1     | {e}            |
| $9_{35}^2$ | [2.173 2.217]            | [1.768 1.805]               | [0.394 0.422]               | $9_{35}^{2*}$ | $9_{35}^{2*+++}$      | 1     | {e}            |
| $9_{36}^2$ | [0.239 0.26]             | [0.188 0.207]               | [0.047 0.057]               | $9_{36}^{2*}$ | $9_{36}^{2*++}$       | 0     | $\Sigma_{4,2}$ |
| $9_{37}^2$ | [1.363 1.405]            | [1.356 1.393]               | [-0.001 0.02]               | $9_{37}^{2*}$ | $9_{37}^{2*++}$       | 0     | $\Sigma_{4,2}$ |
| $9_{38}^2$ | [1.479 1.509]            | [1.478 1.504]               | [-0.004 0.011]              | $9_{38}^{2*}$ | $9_{38}^{2*+-}$       | 2     | $\Sigma_{2,1}$ |
| $9_{39}^2$ | [3.388 3.416]            | [3.391 3.415]               | [-0.01 0.008]               | $9_{39}^{2*}$ | $9_{39}^{2*+++}$      | 1     | {e}            |
| $9_{40}^2$ | [1.752 1.795]            | [2.398 2.434]               | [-0.656 -0.629]             | $9_{40}^{2*}$ | $9_{40}^{2*+++}$      | 3     | $\Sigma_{2,1}$ |
| $9_{41}^2$ | [1.36 1.419]             | [1.218 1.266]               | [0.127 0.169]               | $9_{41}^{2*}$ | $9_{41}^{2*+++}$      | 0     | $\Sigma_{2,1}$ |
| $9_{42}^2$ | [0.574 0.633]            | [0.792 0.842]               | [-0.232 -0.195]             | $9_{42}^{2*}$ | $9_{42}^{2*+-}$       | 1     | $\Sigma_{2,1}$ |
| $9_{43}^2$ | [6.236 6.318]            | [6.188 6.26]                | [0.033 0.073]               | $9_{43}^{2*}$ | $9_{43}^{2*+-}$       | 2     | $\Sigma_{2,1}$ |
| $9_{44}^2$ | [6.003 6.134]            | [6.082 6.198]               | [-0.101 -0.043]             | $9_{44}^{2*}$ | $9_{44}^{2*++}$       | 0     | $\Sigma_{4,2}$ |
| $9_{45}^2$ | [4.63 4.706]             | [4.591 4.66]                | [0.025 0.06]                | $9_{45}^{2*}$ | $\tau 9_{45}^{2*+++}$ | 2     | $\Sigma_{2,1}$ |
| $9_{46}^2$ | [4.362 4.4]              | [4.43 4.464]                | [-0.074 -0.057]             | $9_{46}^{2*}$ | $9_{46}^{2*++}$       | 0     | $\Sigma_{4,2}$ |
| $9_{47}^2$ | [4.595 4.634]            | [4.638 4.672]               | [-0.05 -0.032]              | $9_{47}^{2*}$ | $9_{47}^{2*++}$       | 0     | $\Sigma_{4,2}$ |
| $9_{48}^2$ | [4.745 4.84]             | [4.682 4.766]               | [0.047 0.089]               | $9_{48}^{2*}$ | $\tau 9_{48}^{2*+++}$ | 2     | $\Sigma_{2,1}$ |
| $9_{49}^2$ | [4.083 4.166]            | [3.8 3.869]                 | [0.266 0.314]               | $9_{49}^{2*}$ | $\tau 9_{49}^{2*+-}$  | 3     | $\Sigma_{2,1}$ |
| $9_{50}^2$ | [2.539 2.576]            | [2.949 2.98]                | [-0.418 -0.397]             | $9_{50}^{2*}$ | $\tau 9_{50}^{2*+-}$  | 1     | $\Sigma_{2,1}$ |
| $9_{51}^2$ | [2.646 2.673]            | [3.008 3.03]                | [-0.368 -0.352]             | $9_{51}^{2*}$ | $\tau 9_{51}^{2*+-}$  | 3     | $\Sigma_{2,1}$ |
| $9_{52}^2$ | [4.12 4.151]             | [3.762 3.788]               | [0.351 0.37]                | $9_{52}^{2*}$ | $\tau 9_{52}^{2*+-}$  | 1     | $\Sigma_{2,1}$ |
| $9_{53}^2$ | [2.132 2.16]             | [1.07 1.09]                 | [1.056 1.076]               | $9_{53}^{2*}$ | $9_{53}^{2*+-}$       | 4     | $\Sigma_{4,1}$ |
| $9_{54}^2$ | [1.348 1.401]            | [0.681 0.723]               | [0.651 0.693]               | $9_{54}^{2*}$ | $9_{54}^{2*+-}$       | 1     | $\Sigma_{4,1}$ |
| $9_{55}^2$ | [6.099 6.15]             | [6.157 6.202]               | [-0.067 -0.044]             | $9_{55}^{2*}$ | $9_{55}^{2*+++}$      | 0     | $\Sigma_{4,2}$ |
| $9_{56}^2$ | [4.696 4.744]            | [4.65 4.692]                | [0.038 0.06]                | $9_{56}^{2*}$ | $\tau 9_{56}^{2*+++}$ | 0     | $\Sigma_{4,2}$ |

| L          | $\mathcal{S}_{200}(L++)$ | $\mathcal{S}_{200}(L++, 1)$ | $\mathcal{S}_{200}(L++, 2)$ | Rolfesen     | KP                | lk(L) | Sym            |
|------------|--------------------------|-----------------------------|-----------------------------|--------------|-------------------|-------|----------------|
| $9_{57}^2$ | [0.563 0.593]            | [0.897 0.922]               | [-0.341 - 0.323]            | $9_{57}^2 *$ | $9_{57}^2 +- -$   | 2     | $\Sigma_{2,1}$ |
| $9_{58}^2$ | [2.171 2.193]            | [1.84 1.859]                | [0.326 0.339]               | $9_{58}^2$   | $9_{58}^2 * +- -$ | 2     | $\Sigma_{2,1}$ |
| $9_{59}^2$ | [6.438 6.503]            | [6.413 6.471]               | [0.014 0.043]               | $9_{59}^2 *$ | $9_{59}^2 +- -$   | 2     | $\Sigma_{2,1}$ |
| $9_{60}^2$ | [4.326 4.397]            | [4.379 4.442]               | [-0.065 - 0.034]            | $9_{60}^2$   | $9_{60}^2 * ++$   | 2     | $\Sigma_{2,1}$ |
| $9_{61}^2$ | [-0.024 0.014]           | [0.886 0.913]               | [-0.918 - 0.891]            | $9_{61}^2$   | $9_{61}^2 ++$     | 4     | $\Sigma_{4,5}$ |