

**KiW 43 Abstract** ( $\omega\epsilon\beta/\text{kiw}$ ). Whether or not you like the formulas on this page, they describe the strongest truly computable knot invariant we know.

**Observations.** • Separates the Rolfsen table; does better than

Khovanov plus HOMFLY-PT on knots with up to 12 crossings (not tested beyond). • The degrees are bounded by the genus!

•  $\rho_1$  vanishes for amphichiral knots. • Has a chance of detecting non-ribbonness ( $\omega\epsilon\beta/\text{akt}$ )!

knot diag	$n'_k$ $(\rho'_1)^+$	Alexander's $\omega^+$	genus / ribbon unknotting # / amphi?	$(\rho'_2)^+$	knot diag	$n'_k$ $(\rho'_1)^+$	Alexander's $\omega^+$	genus / ribbon unknotting # / amphi?	$(\rho'_2)^+$	knot diag	$n'_k$ $(\rho'_1)^+$	Alexander's $\omega^+$	genus / ribbon unknotting # / amphi?	$(\rho'_2)^+$
	$0_1^a$ 0	1	0 / ✓ 0 / ✓			$3_1^a$ $T$	$T-1$	1 / ✗ 1 / ✗			$4_1^a$ 0	$3-T$	1 / ✗ 1 / ✓	
	$5_1^a$ $2T^3+3T$	$T^2-T+1$	2 / ✗ 2 / ✗			$5_2^a$ $5T-4$	$2T-3$	1 / ✗ 1 / ✗			$6_1^a$ $T-4$	$5-2T$	1 / ✓ 1 / ✗	
	$6_2^a$ $T^3-4T^2+4T-4$	$-T^2+3T-3$	2 / ✗ 1 / ✗			$6_3^a$ 0	$T^2-3T+5$	2 / ✗ 1 / ✓			$7_1^a$ $3T^5+5T^3+6T$	$T^3-T^2+T-1$	3 / ✗ 3 / ✗	
	$7_2^a$ $14T-16$	$3T-5$	1 / ✗ 1 / ✗			$7_3^a$ $-9T^3+8T^2-16T+12$	$2T^2-3T+3$	2 / ✗ 2 / ✗			$7_4^a$ $32-24T$	$4T-7$	1 / ✗ 2 / ✗	
	$7_5^a$ $9T^3-16T^2+29T-28$	$2T^2-4T+5$	2 / ✗ 2 / ✗			$7_6^a$ $T^3-8T^2+19T-20$	$-T^2+5T-7$	2 / ✗ 1 / ✗			$7_7^a$ $8-3T$	$T^2-5T+9$	2 / ✗ 1 / ✗	
	$8_1^a$ $5T-16$	$7-3T$	1 / ✗ 1 / ✗			$8_2^a$ $2T^5-8T^4+10T^3-12T^2+13T-12$	$-T^3+3T^2-3T+3$	3 / ✗ 2 / ✗			$8_3^a$ 0	$9-4T$	1 / ✗ 2 / ✓	
	$8_4^a$ $3T^3-8T^2+6T-4$	$-2T^2+5T-5$	2 / ✗ 2 / ✗			$8_5^a$ $-2T^5+8T^4-13T^3+20T^2-22T+24$	$-T^3+3T^2-4T+5$	3 / ✗ 2 / ✗			$8_6^a$ $5T^3-20T^2+28T-32$	$-2T^2+6T-7$	2 / ✗ 2 / ✗	
	$8_7^a$ $-7T^5+4T^4-10T^3+12T^2-13T+12$	$T^3-3T^2+5T-5$	3 / ✗ 1 / ✗			$8_8^a$ $-T^3+4T^2-12T+16$	$2T^2-6T+9$	2 / ✓ 2 / ✗			$8_9^a$ 0	$-T^3+3T^2-5T+7$	3 / ✓ 1 / ✓	
	$8_{10}^a$ $-7T^5+4T^4-11T^3+16T^2-21T+20$	$T^3-3T^2+5T-5$	3 / ✗ 2 / ✗			$8_{11}^a$ $5T^3-24T^2+39T-44$	$-2T^2+7T-9$	2 / ✗ 1 / ✗			$8_{12}^a$ 0	$T^2-7T+13$	2 / ✗ 2 / ✓	
	$8_{13}^a$ $-7T^3+4T^2-14T+20$	$2T^2-7T+11$	2 / ✗ 1 / ✗			$8_{14}^a$ $5T^3-28T^2+57T-68$	$-2T^2+8T-11$	2 / ✗ 1 / ✗			$8_{15}^a$ $21T^3-64T^2+120T-140$	$3T^2-8T+11$	2 / ✗ 2 / ✗	
	$8_{16}^a$ $T^5-6T^4+17T^3-28T^2+35T-36$	$T^3-4T^2+8T-9$	3 / ✗ 2 / ✗			$8_{17}^a$ 0	$-T^3+4T^2-8T+11$	3 / ✗ 1 / ✓			$8_{18}^a$ 0	$-T^3+5T^2-10T+13$	3 / ✗ 2 / ✓	
	$8_{19}^a$ $-3T^5-4T^2-3T$	$T^3-T^2+1$	3 / ✗ 3 / ✗			$8_{20}^a$ $4T-4$	$T^2-2T+3$	2 / ✓ 1 / ✗			$8_{21}^a$ $T^3-8T^2+16T-20$	$-T^2+4T-5$	2 / ✗ 1 / ✗	

knot diag	$n'_k$ $(\rho'_1)^+$	Alexander's $\omega^+$	genus / ribbon unknotting # / amphi?	$(\rho'_2)^+$	knot diag	$n'_k$ $(\rho'_1)^+$	Alexander's $\omega^+$	genus / ribbon unknotting # / amphi?	$(\rho'_2)^+$
	$9_1^a$ $4T^7+7T^5+9T^3+10T$	$T^4-T^3+T^2-T+1$	4 / ✗ 4 / ✗			$9_2^a$ $30T-40$	$4T-7$	1 / ✗ 1 / ✗	
	$9_3^a$ $-13T^5+12T^4-25T^3+20T^2-32T+24$	$2T^3-3T^2+3T-3$	3 / ✗ 3 / ✗			$9_4^a$ $23T^3-28T^2+46T-44$	$3T^2-5T+5$	2 / ✗ 2 / ✗	

Video and more: <http://www.math.toronto.edu/~drorbn/Talks/CRM-1907>,  
<http://www.math.toronto.edu/~drorbn/Talks/UCLA-191101>.