

**Strong.** Testing  $\Theta = (\Delta, \theta) \in \mathbb{Z}[T^{\pm 1}] \times \mathbb{Z}[T_1^{\pm 1}, T_2^{\pm 1}]$  vs. a slew of other reasonably-computable invariants on prime knots up to mirrors and reversals, counting the number of distinct values (deficits shown):

| $n$                            | $\leq 10$ | $\leq 11$ | $\leq 12$ | $\leq 13$ | $\leq 14$ | $\leq 15$ |
|--------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| knots                          | 249       | 801       | 2,977     | 12,965    | 59,937    | 313,230   |
| $\Delta$                       | (38)      | (250)     | (1,204)   | (7,326)   | (39,741)  | (236,326) |
| $\sigma_{LT}$                  | (108)     | (356)     | (1,525)   | (7,736)   | (40,101)  | (230,592) |
| $J$                            | (7)       | (70)      | (482)     | (3,434)   | (21,250)  | (138,591) |
| $Kh$                           | (6)       | (65)      | (452)     | (3,226)   | (19,754)  | (127,261) |
| $H$                            | (2)       | (31)      | (222)     | (1,839)   | (11,251)  | (73,892)  |
| $Vol$                          | (~6)      | (~25)     | (~113)    | (~1,012)  | (~6,353)  | (~43,607) |
| $(Kh, H, Vol)$                 | (~0)      | (~14)     | (~84)     | (~911)    | (~5,917)  | (~41,434) |
| $(\Delta, \rho_1)$             | (0)       | (14)      | (95)      | (959)     | (6,253)   | (42,914)  |
| $(\Delta, \rho_1, \rho_2)$     | (0)       | (14)      | (84)      | (911)     | (5,926)   | (41,469)  |
| $(\rho_1, \rho_2, Kh, H, Vol)$ | (0)       | (~14)     | (~84)     | (~911)    | (~5,916)  | (~41,432) |
| $\Theta$                       | (0)       | (3)       | (19)      | (194)     | (1,118)   | (6,758)   |
| $(\Theta, \rho_2)$             | (0)       | (3)       | (10)      | (169)     | (982)     | (6,341)   |
| $(\Theta, \sigma_{LT})$        | (0)       | (3)       | (19)      | (194)     | (1,118)   | (6,758)   |
| $(\Theta, Kh)$                 | (0)       | (3)       | (18)      | (185)     | (1,062)   | (6,555)   |
| $(\Theta, H)$                  | (0)       | (3)       | (18)      | (185)     | (1,064)   | (6,563)   |
| $(\Theta, Vol)$                | (0)       | (~3)      | (~10)     | (~169)    | (~973)    | (~6,308)  |
| $(\Theta, \rho_2, Kh, H, Vol)$ | (0)       | (~3)      | (~10)     | (~169)    | (~972)    | (~6,304)  |

**Fast.** Here's  $\Theta$  on a random 300 crossing knot (from [DHOEBL]). This proves that I don't belong.

**Fun.** There's so much more to see in 2D pictures than in 1D ones! Yet almost nothing of the patterns you see we know how to prove. We'll have fun with that over the next few years. Would you join?

**Meaningful.**  $\theta$  gives a genus bound (with yet-unwritten proof).

Also,  $\theta$  seems to give a criterion for a knot to be fibered (conjectured with a large scale verification). There are "safe" conjectured characterizations of  $\theta$  as "the two loop invariant" and as "the one cobracket invariant". We hope (with reason)  $\theta$  will say something about ribbon knots.

