

Topological u->ribbon and v->ribbon maps

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[Dylan's construction:](#) (from 2008-06/Rings and Wickets)

$$\gamma \subset \Sigma \xrightarrow{\quad} \gamma \times S^1 \subset \Sigma \times D^2 \subset \mathbb{R}^4$$

\uparrow
 in a natural way, via the natural unknotting.
 $\Sigma \hookrightarrow \mathbb{R}^3$

<http://drorbn.net/bbs/show?shot=Dancso-130325-165719.jpg>:

Two maps.

$$(S^2 \times S^1 \setminus D^2(\infty) \times S^1) \cup_2 (S^1 \times D^2) = S^3$$

$u \rightarrow$ ribbons in $S^4 = K_4^r$

$\gamma \subset S^3 \rightarrow \gamma \times S^1 \subset (S^3 \times S^1 \setminus D^3(\infty) \times S^1) \cup_2 (S^2 \times D^2)$

"Spinning"

$$2(D^3(\infty) \times S^1) = S^2 \times S^1 = 2(S^2 \times D^2)$$

$v \rightarrow K_4^v$

Knots on Σ / stabilization

Knots in $\Sigma \times I$ / stabilization

$$\gamma \subset \Sigma \times I \quad I \circlearrowleft \subset D^2 \subset I \times \mathbb{R}$$

$$\gamma \times S^1 \subset \Sigma \times I \times S^1 \subset \Sigma \times I \times \mathbb{R} \subset \mathbb{R}^3 \times \mathbb{R} = \mathbb{R}^4$$

"Dylan's map"