Ribbon 2-Knots Digest

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* Kinoshita Alexander of 2-spheres in $\mathbb{R}^4$ (1954)
  Every polynomial is the Alexander polynomial of some 2-knot.

* Yajima 1964, Yanagawa 1969 - something about projections to $\mathbb{R}^3$, with simply-singular spheres resulting.

* **STABLE EQUIVALENCE OF RIBBON PRESENTATIONS**
  Author(s):
  YOSHIHIKO MARUMOTO
  We introduce a ribbon presentation to describe a ribbon knot, and equivalences between them. Superspun knots of classical knots are well known to be ribbon knots, and we give a construction of ribbon presentations of the knots by means of classical knot diagrams. We can then extend the classical Reidemeister moves into higher dimensions, and we prove that the presentations of a superspun knot are stably equivalent by using these moves.
  Journal of Knot Theory and Its Ramifications (JKTR)
  Year: 1992 **Vol:** 1 **Issue:** 3 (September 1992) **Page:** 241 - 251
  Pasted from <http://db.worldscinet.com/worldscientific/detail.nsp>

* **Motions of trivial links, and ribbon knots.**
  Yoshihiko Marumoto, Yoshiaki Uchida, and Tomoyuki Yasuda
  Source: Michigan Math. J. Volume 42, Issue 3 (1995), 463-477.
  Pasted from <http://projecteuclid.org/DPubS?verb=Display&version=1.0&service=UI&handle=euclid.mmj/1029005307&page=record>

* Habiro - Kanenobu - Shima Ribbon 2-Knots I (1999)

Abstract. We construct a 'Vassiliev-like' filtration on the free abelian group generated by the set of ribbon 2-links in 4-space in two equivalent ways. This determines a notion of finite type invariants of ribbon 2-links. We prove that the higher derivatives of the normalized Alexander polynomial of ribbon 2-knots at $t = 1$ are of finite type.

- Presentations of π_1 (complement)
- Alexander from Fox; finite type.
- Another filtration:

3. Another filtration of ribbon 2-knots

A 2-knot K in $\mathbb{R}^4$ is *simply knotted* if, after an ambient isotopy of K, the image $p(K)$ under an orthogonal projection $p : \mathbb{R}^4 \to \mathbb{R}^3$ is an immersed sphere whose singular set consists of only double points. It is known ([8], [10]) that a 2-knot is a ribbon 2-knot if and only If it is simply knotted. We will define another filtration for ribbon 2-knots using immersions of 2-spheres into $\mathbb{R}^3$ whose singular set consists of double points.

[8] = Yajima
[10] = Yanagawa

* Habiro - Shima Ribbon 2-Knots II (1999-2001)

Abstract

We prove that all finite type invariants of ribbon 2-knots are polynomials of the coefficients of the power series expansions at $t = 1$ of the normalized Alexander polynomials. We completely determine

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We prove that all finite type invariants of ribbon 2-knots are polynomials of the coefficients of the power series expansions at $t = 1$ of the normalized Alexander polynomials. We completely determine the structure of the algebra of finite type invariants of ribbon 2-knots.

(In as much as I could see, no relation with v/w - knots is stated, no arrow diagrams, though most likely they use the "clasper analog" of arrow diagrams)

Have "Moves on Ribbon presentations".

* Kanenobu-Shima Two Filtrations (1999-2001)

Abstract

We have constructed a 'Vassiliev-like' filtration on the free abelian group generated by the set of ribbon 2-knots in 4-space in two ways: one is from a ribbon 2-disk, and the other from a projection of a ribbon 2-knot onto a generic 3-space whose singular set consists of only double points. Each filtration determines a notion of finite type invariants for ribbon 2-knots. We prove that the two filtrations are the same, and thus, the two finite type invariants are coincident.

Wens are here!
still no v/w -knots.

* Satoh Ribbon Tori (1999)

Abstract

Any ribbon torus-knot in 4-space is naturally associated with a virtual knot. We investigate a relationship between ribbon torus-knots and virtual knots from this viewpoint. We also give a new example of a non-classical virtual knots which can not be detected by the group and the Z-polynomial.

According to Satoh, Yagima 1962 constructed a ribbon tori for each u-knot.

Theorem 3.1. *Any ribbon torus-knot T is associated with some virtual knot diagram K; $T \cong \mathrm{Tube}(K)$.*

Theorem 5.1. *Any ribbon 2-knot S is associated with some virtual arc diagram A; $S \cong \mathrm{Tube}(A)$.* □