

Facts and Dreams About v-Knots and Etingof-Kazhdan, 1

Dror Bar-Natan at Swiss Knots 2011

<http://www.math.toronto.edu/~drorbn/Talks/SwissKnots-1105/>

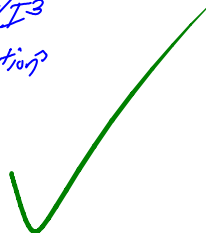
Abstract. I will describe, to the best of my understanding, the relationship between virtual knots and the Etingof-Kazhdan quantization of Lie bialgebras, and explain why, in my humble opinion both topologists and algebraists should care. I am not happy yet about the state of my understanding of the subject but I haven't lost hope of achieving happiness, one day.

IMHO

Abstract Generalities

(R, I) : an algebra and an "augmented ideal" in it.
 $\text{Comp}_I R := \widehat{\text{Hom}} R/I^m$ "the I -adic completion"
 $\mathfrak{g}_{\mathbb{F}} R := \widehat{\bigoplus} I^m/I^{m+1}$ has a product μ_1 especially $\mu_1: (V=I/I^2) \rightarrow I/I^3$
 $\mathcal{A}_I(R) := TV/\langle \ker \mu_1 \rangle$ a "quadratic approximation" of R_1 surjects by M on $\mathfrak{g}_{\mathbb{F}} R$.

Peter:
2001-09
✓ 2008-02



The Prized Object: A "homomorphic \mathcal{A} -expansion"; a filtered $Z: R \rightarrow \mathcal{A}_{\mathbb{F}}(R)$ which induces homomorphic the identity on $I/I^2 = V$.

Dror's Dream. All interesting graded objects and equations in mathematics, especially around quantum groups, arise this way.

To Do.

- The Peter Lee setup for R, I , "all interesting graded equations arise in this way".
- Example: the pure braid group (mention PvB , too).
- Generalized algebraic structures.
- Example: quandles.
- Example: parenthesized braids and horizontal associators.
- Example: KTGs and non-horizontal associators. ("Bracket rise" arises here).
- Example: wKO's and the Kashiwara-Vergne equations.
- vKO's, bi-algebras, E-K, what would it mean to find an expansion, why I care (stronger invariant, more interesting quotients).
- wKO's, uKO's, and Alekseev-Enriquez-Torrossian.
- The third page.

