REIDEMEISTER INVARIANCE FOR KHOVANOV HOMOLOGY

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ABSTRACT.

Mikhail Khovanov constructed cohomology groups whose graded Euler characteristic is Jones polynomial $V_L$ of invariant for links $L$. In other words, for a diagram $D$ of $L$, Khovanov composed bigraded cohomology groups $H^{i,j}(D)$ such that

$$V_L(q) = \sum_{i,j} q^j (-1)^i \dim_Q (H^{i,j}(D) \otimes Q).$$

Oleg Viro made a construction of the Khovanov homology group ($\Delta$ : a cohomology group) of Jones polynomial significantly simpler [4]. Viro constructed Khovanov complex and cohomology consisting of Jordan curves with signs. As Viro describes in his paper[4], the most fundamental property of the Khovanov homology group is their invariance under Reidemeister moves. Then, we wish information on the Reidemeister invariance by using Viro’s simple definition. The chain maps induced by a Reidemeister move are homotopy equivalences. Thus, there exist chain homotopy maps that deduces the homotopy equivalences. Magnus Jacobsson obtained explicitly chain maps induced by a link cobordism [3]. However, these homotopy maps are missing. Therefore, Viro provided a proof for the only case of first Reidemeister move [4]. In this talk, homotopy mappings are obtained explicitly for the other Reidemeister moves, i.e. second and third, by using Viro’s definition of Khovanov homology groups and chain maps as in [3]. The detail is provided by [2].

REFERENCES


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