AN INVARIANT OF FREE KNOTS VALUED IN FREE GROUPS

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In this talk, we study an invariant of free links valued in a certain group presentation. In [1] V. O. Manturov constructed a connection between classical braid group and group presentation generated by crossings with relations derived from Reidemeister moves. However tangles have no group structures because there are no inverse elements for tangles. We shall construct an invariant of free links and free tangles valued in groups as follows; we associate classical crossings with elements in the groups. And we read them with respect to the orientation of a fixed component and we obtain a 'word' in the group. We can show that this word is an invariant for free tangles. For free links, we get a free tangle by cutting arcs of each component and then we can get an invariant for free links. But the invariance has troubles because of crossings between a component and itself. We overcome this difficulty by showing the following statement; *if two diagrams with no pure crossings are equivalent then they are equivalent by a sequence of moves where no intermediate diagram has a pure crossing.*

References

[1] V. O. Manturov, "Non-Reidemeister knot theory and its applications in dynamical systems, geometry, and topology", arXiv:1501.05208v1 [math.GT] 21 Jan 2015.

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