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Algebras Counting Minimal Intersection and Self-Intersection Numbers of Loops on a Surface.

Goldman and Turaev defined a Lie Bialgebra structure on the vector space generated by the nontrivial free homotopy classes of loops on a surface. The Turaev cobracket gives a lower bound on the minimum number of self-intersection points of a loop in a given free homotopy class. Chas showed that this bound is not always sharp. We construct an operation μ which factors through the cobracket, and we show that in contrast to the cobracket, this operation always counts the minimal number of self-intersection points of a loop in a given class. If time permits, we will discuss the corresponding problem for intersections of loops. (Received September 21, 2011)