

1155-57-219

**Mariano Echeverria\*** ([mariano.echeverria@rutgers.edu](mailto:mariano.echeverria@rutgers.edu)). *A Generalization of the Tristram-Levine Knot Signatures as a Singular Furuta-Ohta Invariant for Tor.*

Given a knot  $K$  inside an integer homology sphere  $Y$ , the Casson-Lin-Herald invariant can be interpreted as a signed count of conjugacy classes of irreducible representations of the knot complement into  $SU(2)$  which map the meridian of the knot to a fixed conjugacy class. It has the interesting feature that it determines the Tristram-Levine signature of the knot associated to the conjugacy class chosen. Turning things around, given a 4-manifold  $X$  with the integral homology of  $S^1 \times S^3$ , and an embedded torus which is homologically non trivial, we define a signed count of conjugacy classes of irreducible representations of the torus complement into  $SU(2)$  which satisfy an analogous fixed conjugacy class condition to the one mentioned above for the knot case. Our count recovers the Casson-Lin-Herald invariant of the knot in the product case, thus it can be regarded as implicitly defining a Tristram-Levine signature for tori. This count can also be considered as a singular Furuta-Ohta invariant, and it is a special case of a larger family of Donaldson invariants which we also define. (Received January 14, 2020)