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Eric Harper* (harper@cirget.ca), Universite du Quebec a Montreal, Case postale 8888, Succursale centre-ville, Montreal, Quebec H2X 3Y7, Canada, and **Nikolai Saveliev**. *Casson-Lin type invariants for links*.

In 1992, Xiao–Song Lin constructed an invariant $h(K)$ of knots $K \subset S^3$ that is a signed count of conjugacy classes of irreducible trace–free $SU(2)$ representations of $\pi_1(S^3 \setminus K)$. Lin shows $h(K)$ is one half the knot signature of K . Using methods similar to Lin’s, we construct an invariant $h(L)$ of two–component links $L \subset S^3$. Our invariant is a signed count of conjugacy classes of *projective* $SU(2)$ representations of $\pi_1(S^3 \setminus L)$ with a fixed 2–cocycle and corresponding non-trivial w_2 . We show that $h(L)$ is, up to a sign, the linking number.

In addition, we construct an instanton Floer homology for any link of two components in an integral homology sphere. We show that its Euler characteristic is the linking number between the components of the link and that the Floer homology is nontrivial for nonsplit links in S^3 . (Received February 07, 2011)