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Annular link Floer homology and $\mathfrak{gl}_{1|1}$

The Reshetikhin-Turaev construction for the quantum group $U_q(\mathfrak{gl}_{1|1})$ sends tangles to $\mathbb{C}(q)$-linear maps in such a way that a knot is sent to its Alexander polynomial. Tangle Floer homology is a combinatorial generalization of knot Floer homology which sends tangles to (homotopy equivalence classes of) bigraded dg bimodules. In earlier work with Ellis and Vertesi, we show that tangle Floer homology categorifies a Reshetikhin-Turaev invariant arising naturally in the representation theory of $U_q(\mathfrak{gl}_{1|1})$; we further construct bimodules $\mathcal{E}$ and $\mathcal{F}$ corresponding to E, F in $U_q(\mathfrak{gl}_{1|1})$ that satisfy appropriate categorified relations. After a brief summary of this earlier work, I will discuss how the horizontal trace of the $\mathcal{E}$ and $\mathcal{F}$ actions on tangle Floer homology gives a $\mathfrak{gl}_{1|1}$ action on annular link Floer homology that has an interpretation as a count of certain holomorphic curves. This is based on joint work in progress with Andy Manion and Mike Wong.