

Doubled Khovanov homology

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Abstract. We define a homology theory of virtual links built out of the direct sum of the standard Khovanov complex with itself, motivating the name *doubled Khovanov homology*. We demonstrate that it can be used to show that some virtual links are non-classical, and that it yields a condition on a virtual knot being the connect sum of two unknots. Further, we show that doubled Khovanov homology possesses a perturbation analogous to that defined by Lee in the classical case and define a *doubled Rasmussen invariant*. This invariant is used to obtain various cobordism obstructions; in particular it is an obstruction to sliceness. Finally, we show that the doubled Rasmussen invariant contains the odd writhe of a virtual knot, and use this to show that knots with non-zero odd writhe are not slice.