

ABSTRACT

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This talk is joint work with Scott Baldridge and Willam Rushworth. We define a correspondence between trivalent virtual graphs (trivalent ribbon graphs) and virtual link diagrams (abstract link diagrams) so that it is seen that a generalization of the Penrose evaluation for three-coloring trivalent graphs corresponds to the Kauffman bracket polynomial. The generalization of the Penrose evaluation is a polynomial depending on a perfect matching in the graph. Thus a graph with a perfect matching corresponds to a virtual link.

This leads to an interaction between graph theory and virtual link theory that allows us to examine many invariants across this relationship and to define integral Khovanov homology for trivalent graphs with perfect matchings.

The definition of Khovanov homology that we discuss is a new simplification of the integral Khovanov homology for virtuals originally defined by Manturov and further studied by Dye, Kaestner and Kauffman. The new version is also studied by Kauffman and Ogasa and by Baldridge, Kauffman and McCarty.