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Automorphisms of planar algebras

For every locally finite bipartite graph, there exists a corresponding bipartite graph planar algebra. Any sufficiently small planar subalgebra of a bipartite graph planar algebra is of subfactor type, i.e., there exists a subfactor with this subalgebra as its standard invariant. We may in theory obtain new subfactor planar algebras by starting with a bipartite graph and looking for small subalgebras. In fact any subfactor planar algebra may be embedded in the bipartite graph planar algebra corresponding to the principal graph of the subfactor, so this construction is universal.

I will discuss a new method of finding small planar subalgebras of bipartite graph planar algebras. An automorphism of a planar algebra is an invertible graded linear map which commutes with the entire planar operad. The fixed points of a planar algebra under a group of such automorphisms is a planar subalgebra. I will classify all automorphisms of arbitrary bipartite graph planar algebras, and give conditions on the graph for groups of automorphisms to exist such that the resulting fixed-point planar subalgebras are of subfactor type. I will describe some of the new examples of subfactor planar algebras resulting from this construction.