

Categorical duals of nonabelian lattice gauge theories

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The usual duality between an abelian group and the group of its characters gives rise to the well known notion of the dual of an abelian lattice gauge theory which is of considerable importance in physics. The development of a concept of a dual for nonabelian lattice gauge theories has long been prevented by the fact that the Doplicher-Roberts Theorem shows that the dual of a nonabelian group is no longer a group but a certain monoidal category. After very briefly reviewing the needed concepts from physics (in order to make the talk selfcontained), we present a categorical construction of such duals, making use of a functorial reformulation of the notion of a lattice gauge theory (due to J. Baez). We show that the commutative tetrahedron of 2-category theory immediately leads to a gauge invariant action for the dual theories. As an example, we discuss the case of the gauge group $SU(2)$.

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