A NO-GO THEOREM FOR NONABELIONIC STATISTICS IN
GAUGED LINEAR SIGMA-MODELS

INDRANIL BISWAS AND NUNO M. ROMÃO

ABSTRACT. Gauged linear sigma-models at critical coupling on Riemann surfaces yield self-dual field theories, their classical vacua being described by the vortex equations. For local models with structure group $U(r)$, we give a description of the vortex moduli spaces in terms of a fibration over symmetric products of the base surface $\Sigma$, which we assume to be compact. Then we show that all these fibrations induce isomorphisms of fundamental groups. A consequence is that all the moduli spaces of multivortices in this class of models have abelian fundamental groups. We give an interpretation of this fact as a no-go theorem for the realization of nonabelions through the ground states of a supersymmetric version (topological via an A-twist) of these gauged sigma-models. This analysis is based on a semi-classical approximation of the QFTs via supersymmetric quantum mechanics on their classical moduli spaces.

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