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Non abelian T-duality in Gauged Linear Sigma Models. (English) Zbl 1390.81488

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Summary: Abelian T-duality in Gauged Linear Sigma Models (GLSM) forms the basis of the physical understanding of Mirror Symmetry as presented by *K. Hori* et al. [Mirror symmetry. Providence, RI: American Mathematical Society (AMS) (2003; Zbl 1044.14018)]. We consider an alternative formulation of abelian T-duality on GLSM's as a gauging of a global U(1) symmetry with the addition of appropriate Lagrange multipliers. For GLSMs with abelian gauge groups and without superpotential we reproduce the dual models introduced by Hori and Vafa loc. cit. We extend the construction to formulate non-abelian T-duality on GLSMs with global non-abelian symmetries. The equations of motion that lead to the dual model are obtained for a general group, they depend in general on semi-chiral superfields; for cases such as SU(2) they depend on twisted chiral superfields. We solve the equations of motion for an SU(2) gauged group with a choice of a particular Lie algebra direction of the vector superfield. This direction covers a non-abelian sector that can be described by a family of abelian dualities. The dual model Lagrangian depends on twisted chiral superfields and a twisted superpotential is generated. We explore some non-perturbative aspects by making an Ansatz for the instanton corrections in the dual theories. We verify that the effective potential for the U(1) field strength in a fixed configuration on the original theory matches the one of the dual theory. Imposing restrictions on the vector superfield, more general non-abelian dual models are obtained. We analyze the dual models via the geometry of their susy vacua.

MSC:

81T40 Two-dimensional field theories, conformal field theories, etc. in quantum mechanics

81T13 Yang-Mills and other gauge theories in quantum field theory

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duality in gauge field theories; sigma models; string duality; supersymmetric gauge theory

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