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T-duality without isometry via extended gauge symmetries of 2D sigma models. (English)

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Summary: Target space duality is one of the most profound properties of string theory. However it customarily requires that the background fields satisfy certain invariance conditions in order to perform it consistently; for instance the vector fields along the directions that T-duality is performed have to generate isometries. In the present paper we examine in detail the possibility to perform T-duality along non-isometric directions. In particular, based on a recent work of Kotov and Strobl, we study gauged 2D sigma models where gauge invariance for an extended set of gauge transformations imposes weaker constraints than in the standard case, notably the corresponding vector fields are not Killing. This formulation enables us to follow a procedure analogous to the derivation of the Buscher rules and obtain two dual models, by integrating out once the Lagrange multipliers and once the gauge fields. We show that this construction indeed works in non-trivial cases by examining an explicit class of examples based on step 2 nilmanifolds.

MSC:

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[gauge symmetry](#); [string duality](#); [sigma models](#)

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