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Wandering around gauge theory vacua

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Abstract

In the context of Yang-Mills theories, we show that a subclass of gauge symmetries should be considered as global symmetries. These symmetries act nontrivially on the vacuum and generate a moduli space of vacua. We show that the Lagrangian induces a metric on the vacuum moduli space, making it a Riemannian manifold. Geodesics of this manifold correspond to an important set of solutions of the theory, namely the electrostatic solutions. These results explain in a different way why global gauge symmetries should be considered as physical, and also leads to an extension of asymptotic symmetries inside the bulk.

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