

Peer Review

Review of: "Dynamical Edge Modes in Yang-Mills Theory"

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The authors have studied the symplectic structure of Yang-Mills theory in the presence of boundary terms, showing that bulk and edge degrees of freedom are necessarily coupled. This seems to be a feature of non-Abelian gauge theories. This article is a natural continuation of a previous paper by the same authors, where they explored the case of Maxwell's theory, and now prepare the ground for a future paper in the context of gravitation.

The study of gauge theories in the presence of boundary terms is a very relevant topic that is often overlooked, and this article presents novel and relevant results on this topic in a clear way, so I recommend its publication.

Since the main result of this paper is that bulk and edge degrees of freedom are coupled, it would be interesting to explore if this result can be obtained directly using Poisson brackets that naturally include boundary terms and compute this from the Hamiltonian (without the need to invert the symplectic form). Such a formulation has been presented in Refs. arXiv:hep-th/9305133, arXiv:hep-th/9806249 (see a recent application of this formalism in arXiv:2309.16760).

Declarations

Potential competing interests: No potential competing interests to declare.