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Nonlinear Constraints Abelianization of a Prototypical Second-Class System using BFFT method

Tuesday 13 December 2022 14:00 (1 hour)

We apply the BFFT formalism to a prototypical second-class system, aiming to convert its constraints from second to first-class. The proposed system admits a consistent initial set of second-class constraints and an open potential function providing room for applications to mechanical models as well as field theory such as the non-linear sigma model. The constraints can be arbitrarily non-linear, broadly generalizing previously known cases. We obtain a sufficient condition for which a simple closed expression for the Abelian converted constraints and modified involutive Hamiltonian can be achieved. As an explicit example, we discuss a particle on a torus model, obtaining the full first-class abelianized constraints in closed form and the corresponding involutive Hamiltonian.

Session

Formal Theory

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Session Classification: Poster - 2