Contribution ID: **35** Type: **Poster**

# Hamilton–Jacobi formulation of the Proca field with gauge symmetry

*Thursday 4 December 2025 19:00 (1 minute)*

We analyze the constraint structure of the Proca field with gauge symmetry within the framework of the Hamilton–Jacobi formalism. The complete set of Hamiltonians generating the system's dynamics is derived from Frobenius' integrability conditions, together with the corresponding characteristic equations. As generators of canonical transformations, the Hamiltonians are naturally related to the generators of the Lagrangian gauge transformations. Finally, suitable gauge conditions are imposed, and the generalized brackets are explicitly determined.

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**Session Classification:** Posters