

Abstract Submitted
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Variational symmetries and conservation laws of the coupled Maxwell-Dirac equations JACKSON FLISS¹, BALRAJ MENON², University of Central Arkansas — The role of symmetry groups has become increasingly important in the study of modern physics. The theorems of Emmy Noether link conservation laws to symmetries of the action functional. Contact symmetries can be constructed from the invariance of the action under infinitesimal transformations that are dependent on the independent variables and the dependent variables. First-order generalized symmetries can be constructed by including the first derivatives of the dependent variables. In the case of the coupled Maxwell-Dirac equations, the independent variables and dependent variables are, respectively, the spacetime coordinates and the fields. In this talk I will review the familiar symmetries of field theory, as well as investigate the first-order generalized symmetries of the coupled Maxwell-Dirac equations. The local conservation laws associated with each of these, via the theorems of Noether, will be addressed as well.

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