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MULTIVECTOR FIELDS OF NOETHER SYMMETRIES IN THE LAGRANGIAN FORMALISM AND BELINFANTE TENSOR

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Abstract. Elsewhere, we gave the explicit expressions of the multivectors fields associated to infinitesimal symmetries which gave rise to Noether currents for classical field theories and relativistic mechanic using the Second Order Partial Differential Equation SOPDE condition for the Poincaré-Cartan form.

The main objective of this paper is to reformulate the multivector fields associated to translational and rotational symmetries of the gauge fields in particular those of the electromagnetic field which gave rise to symmetrical and invariant gauge energy-momentum tensor and the orbital angular momentum. The spin angular momentum appears however because of the internal symmetry inside the fiber.

MSC: 70H10, 70H33
Keywords: Belinfante tensor, field theories, Lagrangian formalism, multisymplectic geometry, relativistic mechanics

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