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A Geometrical Approach to Hojman Theorem of a Rotational Relativistic Birkhoffian System

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Abstract: A geometrical approach to the Hojman theorem of a rotational relativistic Birkhoffian system is presented. The differential equations of motion of the system are established. According to the invariance of differential equations under infinitesimal transformation, the determining equations of Lie symmetry are constructed. A new conservation law of the system, called Hojman theorem, is obtained, which is the generalization of previous results given sequentially by Hojman, Zhang, and Luo et al. In terms of the theory of modern differential geometry a proof of the theorem is given.

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Key words: rotational relativity, Birkhoffian system, Hojman theorem, symmetry, conservation law, differential geometry

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