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**Reference frame symmetries and conservation laws: Galilean versus Lorentzian.**

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Summary: The relation between the symmetry properties of a physical system and conservation laws, although a fundamental topic, is barely treated in educational contexts. In this paper, only using elementary formalism, we explore the connection between energy-momentum conservation laws with the reference frame invariance either in the Galilean or in the Lorentzian context, which is a fundamental symmetry property of any physical system. Some reflections (pedagogically sound and significant either for graduate and university undergraduate students) are also proposed on the different roles played by space and time in pre-relativistic and relativistic mechanics.

*Classification:* M55

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