

On Tensorial Concomitants and the Non-Existence of a Gravitational Stress-Energy Tensor

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Abstract

Based on an analysis of what it may mean for one tensor to depend in the proper way on another, I prove that, under certain natural conditions, there can be no tensor whose interpretation could be that it represents gravitational stress-energy in general relativity. It follows that gravitational energy, such as it is in general relativity, is necessarily non-local. Along the way, I prove a result of some interest in own right about the structure of the associated jet bundles of the bundle of Lorentz metrics over spacetime.

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