

Abstract Submitted
for the APR17 Meeting of
The American Physical Society

Transverse traceless tensors in cosmology and gravitational wave theory BEATRICE BONGA, ABHAY ASHTEKAR, Pennsylvania State University — There exists two distinct notions of transverse tracelessness tensors in the literature. In cosmology there exists a preferred time slicing because of spatial homogeneity and a transverse traceless tensor is a spatial tensor that is traceless and divergence-free with respect to the spatial metric. On the other hand, to study gravitational waves in asymptotically flat spacetimes, one often uses an algebraic projection operator in the asymptotic region to extract the transverse traceless piece of a tensor. A priori, these two notions have nothing to do with each other. The first notion is global in physical 3-space, whereas the second notion is local. Nonetheless, in the literature one often uses them interchangeably. This identification is incorrect. I will discuss the relation between the two notions.

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Date submitted: 20 Sep 2016

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