Semiconformal curvature tensor and fluid space-time in General Relativity

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Abstract

In this paper the divergence of the semiconformal curvature tensor has been studied in detail. The semiconformal cuvature tensor, defined by Ishii is considered invariant under conharmonic transformation and the necessary and sufficient conditions for the semiconformal curvature tensor to be divergence - free in a perfect fluid spacetime has been considered. It is seen that aforenamed spacetimes either satisfy the vacuum - like equation of state or represent a FRW cosmological model. The semiconformal curvature tensor has also been expressed with regards to different known tensors in the literature and association between their divergences have been acquired.