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*Spacetimes with vanishing curvature invariants*

All four-dimensional Lorentzian spacetimes with vanishing scalar invariants constructed from the Riemann tensor and its covariant derivatives (VSI spacetimes) are determined. A subclass of the Kundt spacetimes results and the corresponding VSI metrics can be displayed in local coordinates. Some potential applications of VSI spacetimes are discussed. The algebraic classification of the Weyl tensor in higher dimensional Lorentzian manifolds is then described, and higher dimensional VSI spacetimes are discussed.