On the σ_2-curvature and applications

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 Abstract. Given a Riemannian manifold (M^n, g), the σ_2-curvature is defined by

$$\sigma_2 = -\frac{1}{2}|Ric_g|^2 + \frac{n}{8(n-1)}R_g^2.$$

In this talk, we define a symmetric 2-tensor canonically associated to the σ_2 curvature, then we introduce the notion of σ_2-singular space and under certain hypotheses we prove a rigidity result[2]. After, we give a necessary and sufficient condition for a CPE metric to be Eisntein in terms of σ_2-singular spaces. Such a result improves our understanding about CPE metrics and Besse's conjecture with a new geometric point of view. Finally, we present an almost-Schur lemma for symmetric $(2, 0)$-tensors on a compact Riemannian manifold of nonnegative Ricci curvature with totally geodesic boundary.