Title: The closedness of some generalized curvature 2-forms on a Riemannian manifold I

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In this paper we study the closedness properties of generalized curvature 2-forms, which are said to be Riemannian, Conformal, Projective, Concircular and Conharmonic curvature 2-forms, associated to each generalized curvature tensors on a Riemannian manifold. Corresponding to each curvature tensors, such generalized curvature 2-forms are the associated curvature 2-forms.

In particular, we focus on the closedness of differential 2-forms associated to the divergence of generalized curvature tensors, which is weaker than the notion of harmonic curvature. In this case, we give an algebraic condition involving the Riemann curvature tensor and the Ricci tensor arising from an old identity due to Lovelock.

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