Application of a Bochner type formula for a large class of spaces

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Abstract. We establish a unified Bochner type formula for a large class of spaces, satisfying $f\mathring{Ric} = \mathring{\nabla}^2 f$, that include the static perfect fluid space-time, critical metrics of the volume functional, static spaces and CPE metrics. Moreover, as a consequence of such a formula, we obtain a result guarantees that the geodesic ball on a sphere S^3 is the unique compact static perfect fluid space-time with positive constant scalar curvature such that the norm of the Einstein tensor $|\mathring{Ric}|$ lies in the interval $[0, \frac{\sqrt{6}}{12}(\mu - 3\rho)]$, where μ and ρ are, respectively, the energy density and the pressure. Joint work R. Diógenes, B. Leandro, and E. Ribeiro JR.

References

[1] Coutinho, F., Diógenes, R., Leandro, B., Ribeiro Jr, E.: Static perfect fluid space-time on compact manifolds. Classical and Quantum Gravity, 2019. doi:10.1088/1361-6382/ab5402.