Prescribed m-curvature spheres in warped product manifolds

Barbosa, Joao Lucas M.

Universidade Federal do Ceara, Fortaleza, Brazil

jlucas@secrel.com.br

Abstract

Consider a manifold $M = (0, a) \times S^n(1)$ with a warped metric $ds^2 = dt^2 + f^2(t)d\sigma^2$ where $(0, a)$ is an open interval of the real line, $d\sigma^2$ is the standard metric of the Euclidean unit sphere and $f : (0, a) \to R$ is a differentiable positive real function. Let ψ be a positive function defined on M. We consider the problem of finding a hypersurface of M such that its m-curvature S_m satisfies the equation $S_m = \psi$ and show that, under suitable hypothesis on ψ this problem has solution that is diffeomorphic to a geodesic sphere.