ON SPACE-LIKE SUBMANIFOLDS OF A SPHERE

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ABSTRACT

Y. B. Shen [5] studied curvature pinching for 3-dimensional minimal submanifold in a sphere. In addition, Shen showed that if the scalar curvature of M^3 is larger than 4, then M^3 is totally geodesic. The purpose of this paper is to study geometry of an n-dimensional compact maximal spacelike submanifold in a (n + p)-dimensional unit sphere of constant curvature 1 and index p by studying the Ricci and scalar curvatures of M. We do this by proving the following:

Let M be an n-dimensional compact maximal space-like submanifold of S_p^{n+p}. If the:

(i)   Ricci curvature R is less than $(n-1)\dfrac{3p-1}{2p-1}$, then M is totally geodesic.

(ii)   Scalar curvature ρ is less than $(n-1)\left(n+\dfrac{p}{2p-1}\right)$, then M is totally geodesic.

(iii)   Ricci curvature of M is bounded from above by 3, then M^3 is isomorphic to S^3.

Keywords: Space-like submanifold, totally geodesic.