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On Ricci curvature of C-totally real submanifolds in Sasakian space forms. (English)

Zbl 1012.53039

Acta Math. Acad. Paedagog. Nyházi. (N.S.) 17, 171-177 (2001).

Summary: Let M^n be a Riemannian n-manifold. Denote by $S(p)$ and $\overline{\mathrm{Ric}}(p)$ the Ricci tensor and the maximum Ricci curvature on M^n, respectively. In this paper we prove that every C-totally real submanifold of a Sasakian space form $\overline{M}^{2m+1}(c)$ satisfies $S \leq (\frac{(n-1)(c+3)}{4} + \frac{n^2}{4}H^2)g$, where H^2 and g are the square mean curvature function and metric tensor on M^n, respectively. The equality holds identically if and only if either M^n is totally geodesic submanifold or $n = 2$ and M^n is totally umbilical submanifold. Also we show that if a C-totally real submanifold M^n of $\overline{M}^{2n+1}(c)$ satisfies $\overline{\mathrm{Ric}} = \frac{(n-1)(c+3)}{4} + \frac{n^2}{4}H^2$ identically, then it is minimal.

MSC:

53C25 Special Riemannian manifolds (Einstein, Sasakian, etc.)
53C42 Differential geometry of immersions (minimal, prescribed curvature, tight, etc.)
53C15 General geometric structures on manifolds (almost complex, almost product structures, etc.)

Keywords:

Ricci curvature; C-totally real submanifold; Sasakian space form

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