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On Sasakian manifolds with vanishing contact Bochner curvature tensor II

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§ 1. Introduction

This paper is a continuation of our previous one [7] with the same title, in which we proved the following theorems.

THEOREM A. *Let M be a $(2n+1)$-dimensional Sasakian manifold with constant scalar curvature R whose contact Bochner curvature tensor vanishes. If the square of the length of the η-Einstein tensor is less than*

$$\frac{(n-1)(n+2)^{2}(R+2n)^{2}}{2n(n+1)^{2}(n-2)^{2}}, \qquad n\geqq 3,$$

then M is a space of ϕ-holomorphic sectinal curvature.

THEOREM B. *Let M be a 5-dimensional Sasakian manifold with constant scalar curvature whose contact Bochner curvatur tensor vanishes. If the scalar curvature is not -4, then M is a space of constant ϕ-holomorphic sectional curvature.*

The above two results are analogous to the following theorems proved by S. I. Goldberg, M. Okumura and Y. Kubo.

THEOREM C (S. I. Goldberg and M. Okumura [4]). *Let M be an n-dimensional compact conformally flat Riemannian manifold with constant scalar curvature R. If the length of the Ricci tensor is less than $R/\sqrt{n-1}$, $n\geqq 3$, then M is a space of constant curvature.*

THEOREM D (Y. Kubo [8]). *Let M be a real n-dimensional Kaehlerian manifold with constant scalar curvature R whose Bochner curvatur tensor vanishes. If the length of the Ricci tensor is not greater than $R/\sqrt{n-2}$, $n\geqq 4$, then M is a space of constant holomorphic sectinal curvature.*

REMARK. We improved Theorem D, in [6], as the inequality with respect to the Ricci tensor is the best possible.

Also, S. I. Goldberg, M. Okumura and Y. Kubo have proved the following theorems under the different conditions from Theorem C and D.