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THE AUTOMORPHISM GROUPS OF ALMOST CONTACT RIEMANNIAN MANIFOLDS

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1. Introduction. The maximum dimension of the group of isometries of an m-dimensional connected Riemannian manifold is $m(m+1)/2$. The maximum is attained if and only if the Riemannian manifold is of constant curvature and one of the following spaces (cf. [3], p. 308):

(i) an m-dimensional sphere S^m, or a real projective space RP^m,

(ii) an m-dimensional Euclidean space E^m,

(iii) an m-dimensional simply connected hyperbolic space H^m.

If M is a $2n$-dimensional connected almost Hermitian manifold, then the maximum dimension of the automorphism group of M is $n(n+2)$. The maximum is attained if and only if M is a homogeneous Kaehlerian manifold with constant holomorphic sectional curvature k and one of the following spaces (cf. [17]):

(i) a complex projective space CP^n with a Fubini-Study metric ($k>0$),

(ii) a unitary space CE^n ($k=0$),

(iii) an open ball CD^n with a homogeneous Kaehlerian structure of negative constant holomorphic sectional curvature ($k<0$).

In this paper we consider the similar problem in almost contact Riemannian manifolds. To state the main theorem we prepare the followings. We denote by (ϕ, ξ, η, g) structure tensors of an almost contact Riemannian manifold N. An odd dimensional sphere S^{2n+1} (in E^{2n+2}) has the standard Sasakian structure (cf. [11]). An odd dimensional Euclidean space E^{2n+1} has also the standard Sasakian structure ([8], [9]). By T or L we denote a circle or a line. By (L, CD^n) we denote a line bundle over a CD^n (which is a product bundle). The space (L, CD^n) has a Sasakian structure (§8). In these three spaces ξ is an infinitesimal automorphism of the structure and generates a 1-parameter group $\exp t\xi$ $(-\infty<t<\infty)$ of automorphisms. Definitions of an $\mathcal{E}$-deformation

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