CERTAIN INFINITESIMAL TRANSFORMATION OF NORMAL CONTACT METRIC MANIFOLD

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Introduction.

In the previous paper [2], the author studied infinitesimal conformal and projective transformations of normal contact metric manifold. In the present paper, we study certain infinitesimal transformation of normal contact metric manifold and prove the following

THEOREM 1. *In a normal contact metric manifold, any curvature-preserving infinitesimal transformation is necessarily an infinitesimal isometry.*

If the above theorem is proved, we have obviously the following

THEOREM 2. *In a normal contact metric manifold, an infinitesimal affine transformation is necessarily an infinitesimal isometry.*

THEOREM 3. *In a normal contact metric manifold, an infinitesimal homothetic transformation is necessarily an infinitesimal isometry.*

1. Normal contact metric manifold.

Let M be a differentiable manifold of dimension $2n+1$. If there is defined on M a differentiable 1-form η having the property that

$$(1.1)\qquad \eta\wedge\overbrace{d\eta\wedge\cdots\wedge d\eta}^{n}\neq 0,$$

then, M and η are respectively called a contact manifold and a contact form on M.

Now we put $\phi=d\eta$, that is

$$2\phi_{ji}=\partial_j\eta_i-\partial_i\eta_j,$$

where η_i, ϕ_{ji} denote the components of the form ϕ and η respectively. We denote by g_{ji} the Riemannian metric tensor such that $\phi_i{}^h=g^{hr}\phi_{ir}$, $\eta^i=g^{ir}\eta_r$ satisfy the following properties:

$$(1.2)\qquad g_{ji}\eta^j\eta^i=1,$$

$$(1.3)\qquad \phi_j{}^i\eta_i=0,$$

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