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COMPACT HYPERSURFACES IN AN ODD DIMENSIONAL SPHERE

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Introduction.

As is well known, a $(2n+1)$-dimensional sphere $S^{2n+1}(c)$ of constant curvature c is naturally endowed with a normal contact metric structure and any hypersurface M in $S^{2n+1}(c)$ admits also an (f, g, u, v, λ)-structure, which is defined by Yano and Okumura [8], induced from the Sasakian structure in $S^{2n+1}(c)$. For an (f, g, u, v, λ)-structure, the exterior derivatives of the dual 1-form of the vector field u is equal to twice of the fundamental 2-form induced from f. It might be interesting to study the manifold structure of the hypersurfaces of an odd-dimensional sphere, when the exterior derivatives of the dual 1-form of v is proportional to the fundamental 2-form induced from f. Recently, in this sense, taking in connection with the paper due to Blair, Ludden and Yano [1], the present authors [4] have proved the following

THEOREM. *Let M be a complete orientable hypersurface with constant scalar curvature in $S^{2n+1}(1)$. We assume that, for an (f, g, u, v, λ)-structure on M, there exists a constant ϕ such that*

$$(0.1) \qquad H_k{}^i f_j{}^k + f_k{}^i H_j{}^k = 2\phi f_j{}^i,$$

or equivalently

$$(0.2) \qquad \nabla_j v_i - \nabla_i v_j = 2\phi f_{ji},$$

where $H_j{}^i$ denotes components of the second fundamental tensor in M. Then either of the following two assertions (a) *and* (b) *is true*:

(a) *M is isometric to one of the following spaces*:

(1) *the great sphere $S^{2n}(1)$;*

(2) *the small sphere $S^{2n}(c)$, where $c=1+\phi^2$;*

(3) *the product manifold $S^{2n-1}(c_1)\times S^1(c_2)$, where $c_1=1+\phi^2$ and $c_2=1+1/\phi^2$;*

(4) *the product manifold $S^n(c_1)\times S^n(c_2)$, where $c_1=2(1+\phi^2+\phi\sqrt{1+\phi^2})$ and $c_2=2(1+\phi^2-\phi\sqrt{1+\phi^2})$.*

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