Proceedings of The 23rd International Differential Geometry Workshop on
Submanifolds in Homogeneous Spaces & Related Topics 23(2021) 1-2

Title : Hopf real hypersurfaces in the complex quadric

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(2010 Mathematics Subject Classification : 53C30, 53B21.)

Abstract. In this talk, we introduce .

1 Introduction

Let (M, g) be a Riemannian manifold with a Riemannian metric g. Then the conformal transformation on M is characterized by the metric tensor. A concircular transformation is by definition a conformal transformation preserving geodesic circle, which was introduced by K. Yano [**?**]. The concept of concircular vector field and concircular scalar field are characterized by the differential equations and the term concircular comes from the concircular transformation.

2 Concircular scalar fields in the Riemannian manifolds

Theorem 2.1 ([**?**])**.** *If a complete Riemannian manifold M of dimension $n \geq 2$ admits a concircular scalar field ρ, then $N \leq 2$ and M is conformal to one of the following manifolds:*

(A) *if $N = 0$, a direct product $V \times J$ of an $(n-1)$-dimensional complete Riemannian manifold V with an open interval J of a straight line,*

Key words and phrases: Hopf real hypersurface, complex quadric, singular normal vector field.

* This work was supported by grant Proj. No. ********** from National Research Foundation of Korea.

(B) *if $N = 1$, an n-dimensional Euclidean domain interior to an $(n-1)$-dimensional sphere, and consequently an n-dimensional hyperbolic space, and*

(C) *if $N = 2$, an n-dimensional spherical space,*

where N is the number of isolated stationary points of a concircular scalar field.

Problem 1. *Generalize Theorem* **??***, that is, what is the condition for $M = \times_f F$ to be gradient Ricci soliton or Ricci soliton.*

Remark 2.2. It may be interesting to consider the Ricci soliton or concircular geometry in the manifold with twisted metric.

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