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Osaka J. Math.
16 (1979), 431-438

A HYPERSURFACE OF THE IRREDUCIBLE HERMITIAN SYMMETRIC SPACE OF TYPE EIII

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(Received March 11, 1978)

Introduction

Let M be the compact irreducible Hermitian symmetric space of type *EIII*. Then M can be imbedded holomorphically and isometrically into the 26 dimensional complex projective space $P_{26}(\boldsymbol{C})$ (Nakagawa and Takagi [5]). In this note we prove the following theorem.

Theorem. *There exists a hyperplane W of $P_{26}(\boldsymbol{C})$ such that $M \cap W$ is a hypersurface of M and a Kähler C-space. Further $M \cap W = G/U$, where G is the simply connected complex simple Lie group of type F_4 and U is a parabolic Lie subgroup of G.*

It has been proved that there is no non-zero holomorphic vector field on the hypersurfaces of M with degree>1 (Kimura [3]). The theorem shows that the above result does not hold for a hypersurface of M with degree 1.

The author would like to express his gratitude to Professor S. Murakami and Doctor Y. Sakane for their useful suggestions and encouragements.

1. The exceptional Lie algebras of type F_4 and E_6

First we shall recall Chevalley-Schafer's models of the complex simple Lie algebras of type F_4 and E_6. Denote by Q the quaternion algebra over $\boldsymbol{C}$ with the usual base $\{1, i, j, k\}$ subject to the multiplication rules:

$$i^2 = j^2 = k^2 = -1, ij = k = -ji, jk = i = -kj, ki = j = -ik .$$

Then the Cayley algebra $\mathfrak{C}$ over $\boldsymbol{C}$ can be defined as $\mathfrak{C} = Q + Q \cdot e$ (direct sum) with the following multiplication rule:

$$(a+be)(c+de) = (ac-\bar{d}b)+(da+b\bar{c})e$$

for $a,b,c,d \in Q$. Here $a \to \bar{a}$ is the usual involution in Q.

We define a 27 dimensional Jordan algebra $\mathfrak{J}$ by