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Almost Hermitian homogeneous manifolds and Lie groups

Elsa Abbena* and Sergio Garbiero *

Abstract

Comparing the classifications of almost Hermitian structures and almost Hermitian homogeneous structures, we obtain some geometrical results about different classes of almost Hermitian homogeneous manifolds. In particular we study the Lie groups endowed with left invariant metrics and compatible almost complex structures. Some examples are discussed in detail.

1. Introduction

Let (M, g, J) be an almost Hermitian homogeneous manifold, that is an almost Hermitian manifold which admits a transitive and effective Lie group G of holomorphic isometries acting on it.

In 1978, K. Sekigawa proved the following

THEOREM 1.1 [Se]. *A connected, simply–connected and complete almost Hermitian manifold (M, g, J) is homogeneous if and only if there exists a tensor field T*

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