Results of my research.

In 1965, O'Neill has introduced the notion of isotropic immersion, which is as follows: Let f be an isometric immersion of (M_1, g_1) into (M_2, g_2), and let σ denote the second fundamental form of f. Then f is called *isotropic*, if $\sqrt{\mathrm{g}_2(\sigma(v,v),\sigma(v,v))}/\mathrm{g}_1(v,v)$ is constant for any $p \in M_1$ and $v(\neq 0) \in T_pM_1$. Remark that totally geodesic immersions or totally umbilical immersions are isotropic.

It is known that "parallel immersions of a compact symmetric space M of rank one into a real space form N are isotropic, but there exists an isotropic immersion of M into N which is not parallel." In [1], [2], [4], [6], [7], [10] and [12], we give a sufficient condition for isotropic immersions of M into N to be parallel, in terms of inequalities with respect to the mean curvature or the codimension. [3] is an expository paper about isotropic immersions.

Let $(G, \cdot)$ be a real Lie group, where "$\cdot$" denotes the group operation of G. Suppose that $\mathrm{Lie}(G)$ admits a complex structure. If G is connected, then G is a complex Lie group with respect to "$\cdot$". However in general, G can not be a complex Lie group with respect to "$\cdot$" in the case where G is disconnected. In [5], we give such an example.

In [8], we give a method for determining the centralizer of an elliptic element in a real semisimple Lie algebra $\mathfrak{g}$, in relation with the maximal compact subalgebra of $\mathfrak{g}$ and the compact dual of $\mathfrak{g}$. Moreover, we determine the H-element of the isotropy subalgebra of each simple irreducible pseudo-Hermitian symmetric Lie algebra.

In [9], we investigate relation between pseudo-Hermitian symmetric pairs and para-Hermitian symmetric ones.

In [11], we classify simple irreducible pseudo-Hermitian symmetric spaces without Berger's classification.

In [13], we determine symplectic homogeneous spaces G/H with G non-compact simple and H compact.