

Plan of study

1. On homogeneous Lagrangian submanifolds in $\mathbb{C}H^n$

We investigate the classification problem of homogeneous Lagrangian submanifolds in $\mathbb{C}H^n$. In particular, we want to consider the complete classification of homogeneous Lagrangian submanifolds obtained by a solvable Lie group action and the dual-actions.

2. On Maslov form

The Maslov form was introduced in a context of generalized Lagrangian mean curvature flow. We want to investigate a symplectic geometrical property of the Maslov form. For instance, we concern a property as an invariant under Hamiltonian isotopies of Lagrangian submanifold and a relation to monotonicity.

3. Construction of H-minimal Lagrangian submanifolds in the complex hyperquadric.

F. Hélein and P. Romon showed that the non-linear partial equation of Hamiltonian minimal Lagrangian surfaces in a Hermitian symmetric space of complex dimension 2 is an integrable system, and proved that the DPW method can be applied for these surfaces. In fact, Hélein-Romon and H. Ma give a Weierstrass formula for H-minimal Lagrangian surfaces in \mathbb{C}^2 and $\mathbb{C}P^2$. Moreover, they also give a classification of H-minimal Lagrangian tori. In this study, we construct an H-minimal Lagrangian surface in the complex hyperquadric by using their method.