**1. The stationary problem of Derivative nonlinear Schroedinger equation**

We study the stationary problem of Derivative nonlinear Schroedinger equation.me (We denote it DNLS in short). The problem describes wave propagation in plasma and many authors has been studied. The stationary problem of DNLS is a nonlocal nonlinear second order boundary value problem. The solutions can be represented by using the complete elliptic integrals and elliptic functions. Now we make anticipation by using the software. Our final goal is to prove the global structure.

We report the representation formula in [H1]. In addition, we have posted the paper ([C1]). This study is a collaboration with Professors Kunimochi Sakamoto (Hiroshima University) and Shoji Yotsutani (Ryukoku University).

**2. Elastic curves with area constraint**

We determined the minimiser of Watanabe's variational problem with the winding number 0 and 1. But, we have not determine the minimizer except for the winding number 0 and 1. We have not proved the condition that the solution is simple. Further, we want to study the second variation of Watanabe's variational problem. Our goal is to prove them.

**3. Tadjbakhsh-Odeh's variational problem**

In 1976, TadjbakhshT-Odeh proposed a variational problem of the equilibrium state of elastic rings under the uniform pressure. The basic assumption is that the length is unextensible under the pressure. There exists the solutions of the variational problem which is not a simple curve. Thus, we consider the following problem:

1. Variational problem of the equilibrium state of elastic rings under the ununiform pressure.

2. Variational problem of the equilibrium state of elastic rings under the assumption that the length is extensible.

3. The functional is blowed up when the curve is not simple curve and singular.