

Research Report (April, 2021- March, 2022)

Enrollment from
April 2017

Department of Pure Mathematics and Applied
Mathematics

Yoshiki KANEKO

I. List of Papers

Yoshiki Kaneko, "Solutions of the tt^* -Toda equations and quantum cohomology of flag manifolds", (submitting)

II. List of Talks

•International presentation : Yoshiki Kaneko, "Solutions of the tt^* -Toda equations and quantum cohomology of minuscule flag manifolds", Nonabelian Hodge theory(Intensive lecture), from 1st to 22^{ed} in July, online.

"Solutions of the tt^* -Toda Equations from Minuscule Flag Manifolds", The international workshop "Geomerty of submanifolds and integrable systems", from 20 to 23 in Feburary, online.

•Domestic presentation : Yoshiki Kaneko, "Local solutions of the tt^* -Toda equations and quantum cohomology of minuscule flag manifolds", geometry symposium, from 31st in August to 3rd in September, online.

"Quantum Drinfeld- Sokolov reduction", Koriyama geometry and physics days, from 14th to 15th in November, Nihon university.

"Deployment of the tt^* geometry", Koriyama geometry and physics days, from 14th to 15th in November, Nihon university.

III. Research Results in AY2021

It was claimed that from the quantum cohomology of CP^n we have a global solution of the tt^* -Toda eqations by Cecotti and Vafa. From this claim, M. Guest and other researchers showed that we have the tt^* -Toda equation by using the DPW method from the DPW potential including the Dubrovin connection from quantum cohomology. In 2020, I proved that the homogeneous spaces which come from minuscule weights correspond to a local solution of the tt^* -Toda equations. Now I have submitted them. In 2021, I did my presentation about this topic. In addition, I studied the Integer Stokes data which are satisfy that all entries of Stokes data are integer. I and Y. Hateruma identified these points on rho line of the fundamental Weyl alcove.

IV. Research Plan for AY2022

We identified the integer Stokes data for rho line. However we do not do for all points of the fundamental Weyl alcove. We will try to identify them by using the same method. If it works well, we consider the aspects in terms of representation theory. This is a goal of this year. If these two works do well, we generalized them for general complex simple Lie groups.