

ATELIER  
« THÉORIE COMBINATOIRE DE REPRÉSENTATION »  
21-25 AVRIL 2014

WORKSHOP  
“COMBINATORIAL REPRESENTATION THEORY”  
APRIL 21–25, 2014

# Exact WKB analysis and cluster algebras

Tomoki Nakanishi <sup>\*</sup>

[nakanisi@math.nagoya-u.ac.jp](mailto:nakanisi@math.nagoya-u.ac.jp)

WEB: [www.math.nagoya-u.ac.jp/~nakanisi/index.html](http://www.math.nagoya-u.ac.jp/~nakanisi/index.html)

---

We develop the mutation theory in the exact WKB analysis using the framework of cluster algebras. Under a continuous deformation of the potential of the Schrödinger equation on a compact Riemann surface, the Stokes graph may change the topology. We call this phenomenon the mutation of Stokes graphs. Along the mutation of Stokes graphs, the Voros symbols, which are monodromy data of the equation, also mutate due to the Stokes phenomenon. We show that the Voros symbols mutate as variables of a cluster algebra with surface realization.

*This is a joint work with Kohei Iwaki (RIMS).*

---

<sup>\*</sup>Graduate School of Mathematics, Nagoya University, Chikusa-ku, Nagoya, 464-8604, JAPAN.