

Title: Introduction to exact WKB analysis II

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Abstract: Exact WKB analysis, developed by Voros et.al., is an effective method for the global study of differential equations (containing a large parameter) defined on a complex domain. In the first and second lecture I'll give an introduction to exact WKB analysis, and recall some basic facts about WKB solutions, Borel resummation, Stokes graphs etc.

On the other hand, cluster algebras are a particular class of commutative subalgebras of the field of rational functions with distinguished generators. I'll explain about a hidden cluster algebraic structure in exact WKB analysis in the third lecture. This is a joint work with Tomoki Nakanishi (Nagoya).

$$\left( \frac{d^2}{dz^2} - \eta^2 \underbrace{Q(z, \eta)}_{Q_0(z) + \eta^{-1} Q_1(z) + \dots} \right) \psi(z, \eta) = 0$$

Koike 2000.  
Publ. RIMS

### Assumptions

- $Q_0(z)$  has only simple zeros
- " " no simple pole &
- Some conditions