

Integrable systems
 whose spectral curve is
 the graph of a function

— partly based on collaboration
 with T. Takebe (nlin/0202042)

- I. SOV of integrable systems
- II. Spectral curve of the form
 $C = \{(u, z) \mid z = A(\lambda)\}$
- III. Example: open Toda molecule
 (and its relativistic (Ruijsendaars)
 version)
- IV. Some other examples (CM, RS)
- V. Variants and generalizations

I. SOV of integrable systems

L2

$$\{H_\ell, H_m\} = 0$$

$$H_\ell(q_1, \dots, q_n, p_1, \dots, p_n) = E_\ell$$

\parallel \parallel
 $\frac{\partial S}{\partial q_1}$ $\frac{\partial S}{\partial q_n}$ $(\ell=1 \dots n)$



canonical transformation

$$(\underline{q}, \underline{p}) \mapsto (\underline{\lambda}, \underline{\mu})$$

$$S = \sum_{j=1}^n S_j(\lambda_j, E_1, \dots, E_n)$$

$$f_\ell(\lambda_j, \mu_j; E_1, \dots, E_n) = 0$$

$(\ell=1, \dots, n)$

separated equation

(of level set = Liouville torus)

- for integrable system

L3

with a Lax representation

$$(L(z) = [L(z), M(z)]),$$

$$f_0(\lambda, \mu) = f(\lambda, \mu)$$

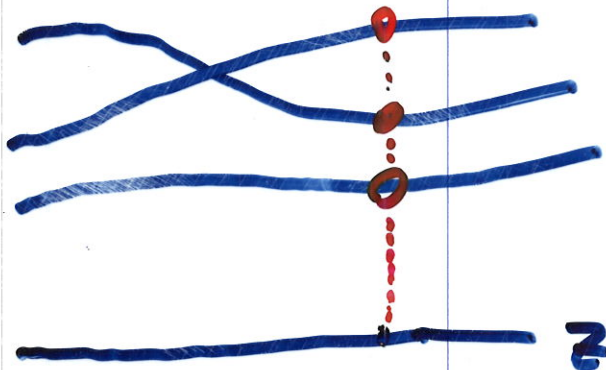
$$= \det(\lambda I - L(z))$$

Spectral curve

$$C: f(\lambda, z) = \det(\lambda I - L(z)) = 0$$

r -fold covering (of sphere, cylinder, torus, ...) if

λ ↑



$L(z)$ is an $n \times n$ matrix