

02-03-28

11

有理函数の空間の上の 可積分系とその拡張

K. Takasaki & T. Takebe

nlin.SI/0202042

- moduli space of rational ftn's
- rational model
- trigonometric) models
elliptic

M : moduli space of rational ②
functions $f(\lambda)$ of degree N
and $f(\infty) = 0$

coordinates:

① $u_1, \dots, u_N, v_1, \dots, v_N$

$$f(\lambda) = \frac{B(\lambda)}{A(\lambda)}, \quad A(\lambda) = \lambda^N + u_1 \lambda^{N-1} + \dots + u_N$$

$$B(\lambda) = v_1 \lambda^{N-1} + \dots + v_N$$

② $\alpha_1, \dots, \alpha_N, p_1, \dots, p_N$

$$f(\lambda) = \sum_{j=1}^N \frac{p_j}{\lambda - \alpha_j}, \quad A(\lambda) = \prod_{j=1}^N (\lambda - \alpha_j)$$

$$p_j = \frac{B(\alpha_j)}{A'(\alpha_j)}$$

$$(P := \sum_{j=1}^N p_j = v_1)$$

Moser's "inverse spectral method" 3

$$f(\lambda) = [(\lambda I - L)^{-1}]_{NN}$$

$$\begin{cases} u_1 = 0 \text{ (center-of-mass frame)} \\ \rho = 1 \end{cases}$$

finite nonperiodic Toda chain



$$\dot{\alpha}_j = 0, \quad \dot{\rho}_j = \alpha_j \rho_j \quad (\text{linearized!})$$

- Application to system control theory
(Krishnaprasad, Nakamura, ...)
- higher flows

$$\dot{\alpha}_j = 0, \quad \dot{\rho}_j = \alpha_j^2 \rho_j$$