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Integrable Lagrangians and Picard modular forms

jeudi 5 septembre 2019 15:15 (45 minutes)

We consider first-order Lagrangians whose Euler-Lagrange equations belong to the class of 3D dispersionless integrable systems. Our main results can be summarised as follows:
(1) A link between integrable Lagrangians and Picard curves/Picard modular forms studied by E. Picard as far back as in 1883 is established.
(2) A parametrisation of integrable Lagrangian densities by generalised hypergeometric functions (solutions of the Picard-Fuchs system governing periods of Picard curves) is obtained.
(3) Conjectured theta representations and power series expansions of the integrable Lagrangian densities are proved.
(based on joint work with F. Cl\'ery A. Odesskii and D. Zagier)

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