

Liouville correspondences between integrable hierarchies

CHANGZHENG QU

Ningbo University, Ningbo 315211, China

Email: quchangzheng@nbu.edu.cn

In this talk, the explicit correspondences between the modified Camassa-Holm (mCH) and modified KdV (mKdV) hierarchies, between the Novikov and Sawada-Kotera hierarchies, and between the Degasperis-Procesi and Kaup-Kupershmidt hierarchies are investigated. It is shown that a pair of Liouville transformations between the isospectral problems of the mCH and mKdV equations, the isospectral problems of the Novikov and Sawada-Kotera equations, and the isospectral problems of the Degasperis-Procesi and Kaup-Kupershmidt equations relate the corresponding hierarchies, in both positive and negative directions, as well as their associated conservation laws. Combining those results with the Miura transformations relating KdV equation and mKdV equation, and the generalized Miura-transformation relating the Sawada-Kotera and Kaup-Kupershmidt equations, we further construct implicit relationships which associate the CH equation and mCH equation, the Novikov and Degasperis-Procesi equations. This is a joint work with Prof. Peter Olver, Prof. Jing Kang and Prof. Xiaochuan Liu.