

Discrete Potential KdV Equation and Elliptic Functions

Da-jun Zhang

Department of Mathematics, Shanghai University

Email: djzhang@staff.shu.edu.cn

There are two ways elliptic curves can play a role in integrable systems: either as elliptic type solutions (i.e. solutions expressible in terms of elliptic functions), or as elliptic deformation of the equations themselves. In either way, the study of the elliptic case is often richer than the rational and trigonometric/hyperbolic case. In this talk, I will show how the Cauchy matrix approach works for the study of the elliptic KdV systems, based on the Sylvester equation with elliptic ingredients. I will also show a kind of soliton solutions expressed via Weierstrass σ function.