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Regular Session:

Speaker: Songlin Zhao (Zhejiang University of Technology, P.R. China)

Collaborators: Guesh Yfter Tela, Han Wang, Da-jun Zhang

Title: *Direct linearization and bilinear structure of a fourth order lattice Gel'fand-Dikii equation*

Abstract: Utilizing the direct linearization approach, we present a fourth order lattice Gel'fand-Dikii (lattice GD-4) equation. This equation is related to a quartic discrete dispersion relation and can be viewed as higher-order member of the lattice Boussinesq equation. The resulting equation is in five-component form, and it is multi-dimensionally consistent by introducing extra equation. Lax integrability is discussed both by direct linearization scheme and also through multidimensional consistent property. Bilinear form and solution in Casoratian of this equation are presented. Based on the obtained soliton solutions, we extend this equation by introducing a parameter δ . This δ -extended lattice GD-4 equation is still consistent around the cube, and its bilinear form together with Casoratian solutions are provided. These works are joint with Guesh Yfter Tela, Han Wang and Da-jun Zhang.