



复旦大学数学科学学院 数学综合报告会

报告题目: On the Novikov peakon system together with its spectral and inverse spectral problems

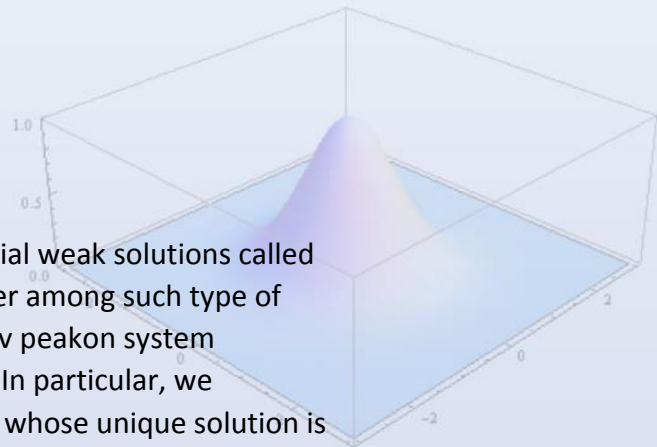
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报告摘要:

A class of nonlinear integrable PDEs admit some special weak solutions called "peakons". The Novikov equation is an intriguing member among such type of PDEs. In this talk, we present some results on the Novikov peakon system together with its spectral and inverse spectral problems. In particular, we introduce a mixed type Hermite--Pad $\{e\}$ approximation whose unique solution is a sequence of polynomials constructed with the help of Pfaffians. These polynomials belong to the family of recently proposed partial-skew-orthogonal polynomials. The relevance of partial-skew-orthogonal polynomials is especially visible in the approximation problem germane to the Novikov peakon problem so that we obtain explicit inverse formulae in terms of Pfaffians by reformulating the inverse spectral problem for the Novikov multipeakons. Furthermore, we investigate two Hermite--Pad $\{e\}$ approximations for the related spectral problem of the discrete dual cubic string, and show that these approximation problems can also be solved in terms of partial-skew-orthogonal polynomials and nonsymmetric Cauchy biorthogonal polynomials. This formulation results in new correspondence among several integrable lattices.



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