Crampin, M.; Saunders, D. J.
The sine-Gordon equation, Tchebyshev nets, and harmonic maps. (English) Zbl 0638.58007

The authors prove (local) existence of Chebyshev nets on every Riemannian 2-manifold. A Chebyshev net is by definition a local coordinate system with the property that the two coordinate vector fields have constant length and that the product of their lengths is unity. It is then shown that the coordinates of the inverse scattering equations define a Chebyshev net and that there is a close connection between the supports of $\delta$-functions. In particular such mass may be concentrated at the right end of the interval $(0,L)$.

Separating the variables and taking into account the nature of the coefficients, the author reduces the problem of finding the characteristic frequencies to the solution of a simple system of recurrent relations.

As the author claims, this method may be used for the solution of the spectral optimization problem.

Reviewer: L. Pastur

MSC:
58E20 Harmonic maps, etc.
35Q99 Partial differential equations of mathematical physics and other areas of application

Keywords:
sine-Gordon equation; Chebyshev nets; Riemannian 2-manifold; inverse scattering equations; spectral optimization problem

Full Text: DOI

References:

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