

**Krichever, I. M.**

**Two-dimensional algebraic-geometric operators with self-consistent potentials.** (English. Russian original) [Zbl 0863.35109](#)  
*Funct. Anal. Appl.* 28, No. 1, 21-32 (1994); translation from *Funkts. Anal. Prilozh.* 28, No. 1, 26-40 (1994).

The article is concerned with the construction of exact solutions of the string equations in  $(2 + 1)$ -dimensional de Sitter spacetime. The author notices that equations describing the problem can be related to a set of linear equations with the self-consistent potentials. Adopting the methods of the construction of exact solutions of the nonlinear Schrödinger equation, he shows that the generalization is so effective that the general nonlinear  $\sigma$ -model equations with the string constraints can be solved. Here the construction of the solution of the nonlinear problem consists in considering the family of integrable linear problems and selecting these with potentials fulfilling the self-consistency conditions.

Firstly, the method of construction of integrable potentials for the two-dimensional nonlinear Schrödinger equation is recalled. Then the constraints for the theory parameters yielding the self-consistency conditions for the string case are analysed. Finally, the  $\Theta$ -functional formulas for the solutions of string theory for  $(2 + 1)$ -dimensional de Sitter spacetime are derived.

Reviewer: [A.Frydryszak \(Wrocław\)](#)

**MSC:**

- [35Q75](#) PDEs in connection with relativity and gravitational theory
- [81U40](#) Inverse scattering problems in quantum theory
- [53Z05](#) Applications of differential geometry to physics
- [81T30](#) String and superstring theories; other extended objects (e.g., branes) in quantum field theory
- [81Q05](#) Closed and approximate solutions to the Schrödinger, Dirac, Klein-Gordon and other equations of quantum mechanics

Cited in **6** Documents

**Keywords:**

[exact string solutions](#); [de Sitter spacetime](#); [self-consistent potentials](#); [nonlinear Schrödinger equation](#)

**Full Text:** [DOI](#)

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