Two solutions to the Drinfeld-Sokolov-Wilson system

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Abstract

In this paper, I describe two solutions to the Drinfeld-Sokolov-Wilson system.
The paper ends with "The End"

Introduction

The Drinfeld-Sokolov-Wilson system[1] is

$$\frac{\partial u(x,t)}{\partial t} + 3v(x,t)\frac{\partial v(x,t)}{\partial x} = 0$$

$$\frac{\partial v(x,t)}{\partial t} = 2\frac{\partial^3 v(x,t)}{\partial x^3} + 2u(x,t)\frac{\partial v(x,t)}{\partial x} + \frac{\partial u(x,t)}{\partial x}v(x,t)$$

In this paper, I describe two solutions to the Drinfeld-Sokolov-Wilson system

The first solution to the Drinfeld-Sokolov-Wilson system

The first solution to the Drinfeld-Sokolov-Wilson system is

$$u(x,t) = \frac{4a^3 + b - 6a^3\tanh^2(ax+bt+c)}{2a}$$

$$v(x,t) = \sqrt{2}\sqrt{a}\sqrt{b}\tanh(ax+bt+c)$$

where $a \neq 0, b, c$ are constants of integration

The second solution to the Drinfeld-Sokolov-Wilson system

The second solution to the Drinfeld-Sokolov-Wilson system is

$$u(x,t) = \frac{4a^3 + b - 6a^3\tanh^2(ax+bt+c)}{2a}$$

$$v(x,t) = -\sqrt{2}\sqrt{a}\sqrt{b}\tanh(ax+bt+c)$$

where $a \neq 0, b, c$ are constants of integration

References

[1] https://en.wikipedia.org/wiki/Drinfeld-Sokolo-Wilson_equation

The End