# Geometric approach to domain wall solution

Zhanat Zhunussova

It is well known, that some generalizations of Landau-Lifschitz equation are integrable and admit physically interesting exact solutions.

We use the geometric approach to one of the generalized Landau-Lifschitz equation

$$\mathbf{S}_t = (\mathbf{S} \times \mathbf{S}_y + u\mathbf{S})_x,$$

$$u_x = -(\mathbf{S}, (\mathbf{S}_x \times \mathbf{S}_y)),$$

where $\mathbf{S}$ is spin vector, $S_1^2 + S_2^2 + S_3^2 = 1$, $\times$ is vector product, $u$ is a scalar function. The equation allows an infinite number of motion integrals and has several exact solutions. One of them is the domain wall solution in the following form

$$S^+(x, y, t) = \frac{expiby}{cosh[a(x - bt - x_0)]},$$

$$S_3(x, y, t) = -tanh[a(x - bt - x_0)],$$

where $a, b$ are real constants. By developing the approach in (2+1)-dimensions we investigate geometric aspects of the solution.

050040, Kazakhstan, Almaty, al-Farabi avenue 71, Al-Farabi Kazakh National University

E-mail: zhzhkh@mail.ru