Soliton deformations of some minimal surfaces

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Abstract: Modified Veselov-Novikov equation was introduced in [1]. A method for constructing exact solutions of this equation by Mutard transformations was proposed in [2] and in [3] was obtained a geometric interpretation of Mutard transformations. It is given by the solution of the Dirac equation and three real constants. Any solution of the Dirac equation defines a surface in three-dimensional Euclidean space, given up to shifts by Weierstrass representation[4]. Fixing the three constants, we completely fix the surface. On this surface are given a conformal parameter, and the potential of the Dirac operator U is the potential representation of the surface. Applying inversion to this surface with its center at the origin, we obtain a new surface with the same conformal parameter and new potential. In this paper applied this transformations for mVN equation on the examples of higher order Enneper's surface, catenoid and helicoid and constructed soliton deformations [5] of this surfaces.

Keywords: Dirac operator, modified Veselov-Novikov equation, Mutard transformations, Enneper's surface,catenoid, helicoid,deformation of surface, inversion.

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