§ Sine Gordon equation

1. $u_{tt} - u_{xx} + \sin\varphi = 0$
2. In light-cone coordinates (u,v) $u = \frac{x+t}{2}, v = \frac{x-t}{2}$ ， $\varphi_{uv} = \sin\varphi$

Soliton solutions：

1. Kink type
2. Breather type
3. Antikink type

$$\frac{\partial^2}{\partial x \partial t} u(x,t) = \sin(u(x,t))$$

Pseudosphere surfaces with constant Gaussian curvature K=-1

$ds^2 = du^2 + 2\cos\varphi dudv + dv^2$ where φ is the angle between the asmptotic lines。

The second fundamental form L=N=0， $M = \sin\varphi$

And the Gauss-Codazzi equation is $\varphi_{uv} = \sin\varphi$

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