Action for entanglement string

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String theory comes from the main postulate, the actions of Nambu-Goto, the particles describe the world surface.

$$I = -\alpha' \int \sqrt{-g} \, d\sigma d\tau$$

$$x_i = (c \, \tau, \, \sigma)$$

However, the main idea is the geometrization of particles in the form of strings.

Quantizing a geometric string generates a number of difficulties, such as extra dimensions and the only free parameter, tension.

This paper considers the possibility of an entangled string with two ends, entangled points of space and without a free parameter.

To do this, I turned to the analysis of my work (the topology of nodes and the problem of hierarchy [1]), where the relationship between energy and volume and fundamental constants can be clearly seen from dimensional considerations.

$$[E][V] = \left[\frac{Gh^2}{c^2} \right]$$

$$l_p^2 = \frac{Gh}{c^3}$$

This led to the consideration of the string as an informational and linear object, through the entanglement of two points of space.

To do this, you must enter the so-called Fisher metric for entanglement.

$$S = \text{tr}(\rho \ln \rho)$$

$$f^{ik} = \frac{\partial^2 S}{\partial x_i \partial x_k}$$

This allows taking into account the dimensions to build a new action for the tangled string. The action is proportional to the product of the Fisher metric on the world surface.

$$I = -\frac{Gh^2}{c^2} \int f^{ik} f_{ik} \, d\sigma d\tau$$

Thus, the world surface of a tangled string is the world's information density in the form of a Fisher metric. Such an approach allows the connection of string theory with the idea of the entanglement of the world surface and the entanglement of space-time.