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The encryption technology of Gravitational waves communication

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Absrtact*: In this paper, a new method of quantum communication encryption is proposed by using the gravitational wave theory recently studied by the author.The ciphertext for every moment of the launch information is all characters in the character set, but plaintext is a specific character determined by a particular Boolean polynomial or a particular Boolean polynomial group. That is, a cryptographic key is the composition of a particular polynomial group.*

Keywords*: Quantum communication, encryption, Bourdeaux terms.*

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I. Introduction

According to the theory of gravitational wave, it is assumed that the information source is the transmitting source under the rotating state of a single line.Suppose that at some point the rotation angle is α, there is a relatively stable eight of launch states of the moment, that is, there are only eight relatively independent launch states of the moment.

Base 1:α + π/2,α + π, α + 3π/2, α +2π ,
Base 2:α + π/4，α + 3π/4，α + 5π/4，α +7π/4.

(When the space station is communicating with the Earth, the base 1 is relatively independent from the base 2. Tens of thousands of light-years away, the base 1 is entangled with the base 2, the instability, the final coincidence.)
Information is the element of the finite field A consisting of two elements of 0 and 1. The additive properties and multiplicative properties are satisfied as follows:

0+0=0，0+1=1，1+0=1，1+1=0；
0×0=0，0×1=0，1×0=0，1×1=1.

Assume that any character information in the ASC I or ASC II character set is emitted. Proof with x_i ($i = 1, 2, ..., 128$) values are all on the finite field A, there are 256 different Boolean polynomials:

$$f1 = f(x_1, x_2, ..., x_{128}), f2 = (x_1, x_2, ..., x_{128}), ..., f256 = (x_1, x_2, ..., x_{128}).$$

It is only necessary to demonstrate that there are 256 different polynomials in the event of the simultaneous launch of the 128-variable x_i , and that the value of all polynomials is equal to 0 (or that the value of all polynomials can be equal to 1).

II. Gravitational wave theory

2.1 Theorem 1：(Gravitational waves existence theory) [1,2,3,4,5,6,7]：There are P, Q two points. P is the wave source of gravitational field, and Q is a point in the gravitational field. The existence of energy rotational motion (including proton, neutron, atomic nucleus or planet) at P is the necessary and sufficient condition of the existence of gravitational waves at Q. Direction is the bidirection of the path tangent at point Q, and the limit of the convergence direction is P point.
Prove：Let say the distance of P and Q is r, if P, Q are stationary points, it only exists the physical factor of "distance r", do not form elements of waves. Only the rotational movement can generate speed and energy. That is the speed of Q point Vb and the angular velocity of P point $d\theta$ have a functional relationship.

$Vb = f(d\theta, r),$ when time $\Delta t \to 0$, angular velocity $\Delta\theta \to 0$, and

$$Vb = \frac{dr}{dt} = \lim_{\Delta\theta \to 0} \frac{[f(\theta+\Delta\theta), r] - [f(\theta), r]}{\Delta\theta},$$

We have a conclusion that P is the wave source of gravitation, and point Q exists the gravitational wave emitted from wave source P.

2.2 Theorem 2(Gravitational wave stability theory) [1,2,3,4,5,6,7]: P is a gravitational wave source, Q is a point in gravitational field of P. The necessary and sufficient conditions of stable gravitational wave at Q point is:

$$\frac{dr}{d\theta} = b$$

, (b is a constant).

Prove: According to Theory 1,

$$Vb = \frac{dr}{dt} = \lim_{\Delta\theta \to 0} \frac{[f(\theta+\Delta\theta), r] - [f(\theta), r]}{\Delta\theta},$$

The necessary and sufficient conditions of stable gravitational wave is that the speed of Q point is stable;
The necessary and sufficient conditions of stable speed at Q point are that the angular velocity of P point is stable;
The necessary and sufficient conditions of stable angular velocity of P point is that the angular velocity of P point and speed of Q point is proportional.

That is,

$$\frac{Vb}{d\theta} = \frac{dr}{d\theta} = b$$

, (b is a constant) and,

$$r = a + b\theta, \qquad (1)$$

formula (1) is the equations of gravitational waves, that is the track of gravitational waves.

Inference of theorem 2: If a gravitational wave track meet Archimedean spiral, this must be stable gravitational waves.

There is, $r = a + b\theta$.

r is the distance of P to Q; a is the spiral length of P to Q; b is the distance between the spirals.

III. The encryption theorem of Zhe yin's single-line rotating information source

Set up a diagonal matrix B consisting of two 8x8 matrices $B1$ and $B2$:

$$B1 = \begin{pmatrix} x_1, x_2, \ldots x_8 \\ \ldots\ldots \\ x_{57}, \ldots\ldots, x_{64} \end{pmatrix}_{8\times 8} \qquad B2 = \begin{pmatrix} x_{65}, x_{66}, \ldots, x_{72} \\ \ldots\ldots \\ x_{121}, \ldots\ldots, x_{128} \end{pmatrix}_{8\times 8}$$

$$B = \begin{cases} B1, 0\,0 \\ 0\,0\, B2 \end{cases}_{16\times 16}$$

There are $BY = 0$. (where Y is the solution vector, the variable x_i takes the definite value)

When the Matrix B is a nonsingular matrix, the $B1$ and $B2$ are not singular. There are 16 different polynomials equal to 0.

For the matrix $B1$ (0 variables do not show), $\pi/2$ counterclockwise rotation 3 times to generate 4 kinds of 8x8 matrix. The flip matrix of $B1$ is rotated 3 times in $\pi/2$ counterclockwise direction, and 4 kinds of 8x8 matrices are generated.

● The Matrix $B1$ the 4x4x8=128 of each other and is equal to 0.

Similarly, The matrix $B2$ (taking 0 variables do not show) altogether produces 4x4x8=128 polynomials that are not identical, and are equal to 0.
In short, when Matrix B is a nonsingular matrix, there are 256 different polynomials, all equal to 0.

Theorem 1: x_i ($i=1,2,...,128$) is a variable that values both on the finite field A, it is possible to construct a nonsingular matrix B(16x16) consisting of an element of x_i whose value is equal to 1. There are 256 distinct Boolean polynomials that are equal to 0 (or all equal to 1). Where a specific polynomial group constitutes a cryptographic key.

IV. The encryption theorem of zhe yin's vertical double linear rotating source

Theorem 2: x_i ($i=1,2,...,128$) is a variable that values both on the finite field A, y_i ($i=1,2,...,128$) is a variable that values both on the finite field A.it is possible to construct a nonsingular matrix B (16x16) and C (16x16) consisting of an element of x_i and y_i whose value is equal to 1. There are 512 distinct Boolean polynomials that are equal to 0 (or all equal to 1). Where a specific polynomial group constitutes a cryptographic key.

V. zhe yin's The encryption theorem of XYZ three vertical straight line revolving source

Theorem 3: x_i ($i=1,2,...,128$) is a variable that values both on the finite field A, y_i ($i=1,2,...,128$) is a variable that values both on the finite field A, $z_i(i=1,2,3,...,128)$ is a variable that values both on the finite field A.it is possible to construct a nonsingular matrix B (16x16) and C (16x16) and D(16x16) consisting of an element of x_i and y_i and z_i whose value is equal to 1. There are 768 distinct Boolean polynomials that are equal to 0 (or all equal to 1). Where a specific polynomial group constitutes a cryptographic key.
If you consider the crossover effect between x_i, y_i, and z_i, the number of polynomials equal to 0 is more.

VI. Conclusion

The key of the encryption technology is that the amount of computation required in the unit time is large enough when decrypted. The three-dimensional decomposition of x_i, y_i, and z_i when receiving information is relatively simple. The information compensation between base 1 and base 2, x_i, y_i, and z_i is the most critical point in the translation of ciphertext. The password is a specific topic service. The need for passwords will fade because the imbalance will fade.

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