# Trajectories of movement inside of "black hole"

Joseph J. Smulsky
625000, Tyumen, POB 1230, Institute of Earth Cryosphere SB RAS,
jsmulsky@mail.ru, http://www.smul1.newmail.ru/

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In file TrctBlcHl the movement trajectories of one particle are given relatively other particle, when particle's velocity in pericentre is nearing to the velocity of light. The force of their interaction is determined by expression:

$$\vec{F} = \frac{k(1-\beta^2)\cdot\vec{R}}{\{R^2 - [\vec{\beta}\times\vec{R}]^2\}^{3/2}}, \qquad (1)$$

where $\vec{R}$ is radius-vector from one particle to other;
$\vec{\beta} = \vec{v}/c_1$ is non-dimensional velocity;
$\vec{v}$ is velocity vector of one particle relatively other;
$c_1$ is the speed of light in environment.

In case of electromagnetic interaction of particles with charges $q_1$ and $q_2$, the coefficient

$$k = q_1 \cdot q_2/\varepsilon, \qquad (2)$$

where $\varepsilon$ is dielectric permeability of medium, when the particles are situated.

These trajectories are represented by two kinds: in polar (Rr, Fi) and Cartesian coordinates (x, y). Origin of coordinates is at centre of one of particles, axis x passes through pericentre of trajectory. Angle Fi is counted from axis x. Besides there are radial velocity Btr, difference of angles dFi between contiguous moments of time and time $T$ of the particle's movement on trajectory, which is counted from the point of pericentre. All values are dimensionless.

Interaction of particles, equations of their movement and evaluation of trajectories are given in works [1] in more details. We consider concept "black hole" not as object of nature, but as the certain ratio of parameters such as radius $R_g$, which is called gravitational radius in contemporary physics. Let's call as its light radius, because the particle, moved from infinity, at the classical law of interaction, having reached this radius, gets speed of light $c_1$. It is determined at gravitational interaction by formula (9.4) of works [1] as

$$R_{gg} = \frac{2G(m_1+m_2)}{c_1^2}, \qquad (3)$$

where $m_1$ and $m_2$ are masses of the interactive bodies,
and according to (9.5) of works [1] the light radius will be written at Coulomb's interaction so:

$$R_{ge} = -\frac{2q_1q_2(m_1+m_2)}{c_1^2 m_1 m_2}, \qquad (4)$$

If the radiuses of particles $R_{b1}$ and $R_{b2}$ are less than light radius $R_g$, their movement can occur inside of sphere with radius $R_g$, i.e. inside of "black hole". In work [1] all possible such movements are researched. Their trajectories are unusual. Particles can move along these trajectories in micro-world. If movements, occurring along such trajectories, will be interpreted with the help of known movements, occurring along ellipse, parabola and hyperbola, micro-world will be perceived incorrectly.

The same values are differently designated in file TrctBlcHl and in works [1]. Therefore basic designations and some their explanations are given below. The non-dimensional trajectory is determined by trajectory parameter

$$\alpha_1 = \mu_1 / \left(R_p v_p^2\right), \qquad (5)$$

where $\mu_1 = \frac{q_1 q_2 (m_1 + m_2)}{\varepsilon m_1 m_2}$ is constant of electromagnetic or $\mu_1 = -G(m_1 + m_2)$ – gravitational interactions;

$R_p$ is radius of the trajectory pericentre;

$v_p$ is velocity in the pericentre.

Interaction of the bodies is determined by interaction parameter

$$\alpha = \frac{2\mu_1}{R_p c_1^2} = -\frac{R_g}{R_p}. \qquad (6)$$

Trajectories are divided into sections and subsections in file TrctBlcHl. In the beginning the interaction characteristics and parameters of the trajectory are given:

Al10 = $\alpha_1^0$; Bto = $\beta_{t0}$; Br0 = $\beta_{r0}$; Al1 = $\alpha_1$, Al = $\alpha$,

where the values with index "0" are referred to the point of trajectory with radius $R_0$, and then go to the trajectory's data:

Rr = $R/R_p$; Btr = $\beta_r = v_r/c_1$; Fi = $\varphi$; x = $x/R_p$; y = $y/R_p$; dFi = $\Delta\varphi$; T = $\bar{t} = t \cdot c_1/R_p$.

## Reference

1. Smulsky, J.J. The Theory of Interaction. - Novosibirsk: Publishing house of Novosibirsk University, Scientific Publishing Center of United Institute of Geology and Geophysics Siberian Branch of Russian Academy of Sciences, 1999. - 293 p. (In Russian: http://www.ikz.ru/~smulski/TVfulA5_2.pdf).

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