Is Black Hole a "Gravitational Grave?"

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Abstract

The equation of the light rays,

$$ds^2 = 0,$$

is quadratic in coordinates' differentials. So, the appearance of complex roots is not excluded, and they have to be considered as well. The classic stationary (static) Schwartzschild solution has three deficiencies of principle:

– it is geodesically "incomplete", i.e. there is only one chart;

– it contains horizons, $r = r_g$;

– the world line of the central body, $r = 0$, is space-like.

This is a tachyon, which does not exist in Nature. This deficiency takes place in the Kruskal metric also.

All these deficiencies are eliminated with the use of complex coolrdinates. Horizons are being passed in any dirrections if the pole at $r = r_g$ is shifted into the complex plane. The shift of the pole follows from the causality principle. This enables one to construct a dynamical solution based on the equations of general relativity without any modifications. The dynamical solution, in contrast to the static one (a neutron star), can have arbitrarily large mass, being the mass defect for the dust-like matter is near 60%.

The theory agrees well with observations (supernova 1987A, cosmic gamma-bursts).

Possible mechanism of the acceleration of electrically neutral matter with formation of narrow jets observed in SS433 is discussed.