Moving into Black Hole: is there a wall?

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Abstract

How much has been said in the media, that Earthman never sees the body B fall into a black hole. Reason: time dilation. But researcher A with rocket has full control of the situation, he can come close to Black Hole, almost to contact and observe everything. Therefore, the distance between A and B may be zero. It does not depend on when in the past the body B was shut into a black hole. Therefore, the black hole horizon has one big collision of bodies. Conclusion: The falling body is flattened on the horizon like by a concrete wall. Reason: on the horizon is singularity. Therefore, near the horizon even the most powerful engine can not operate and will fell into a black hole, reaching relativistic velocities of the fall. However, the space outside the ship becomes shorten through the Lorentz contraction of lengths. And therefore it is more likely to catch B than when A was in safety. A vector and a tensor consist not only of the components, but of the basis vectors. Therefore, multiplying basis vectors on the tensor itself, I get a scalar. Singular scalar, to conclude that even when the singularity were removed from the components, it is moved to the base of the curvature tensor. Therefore "removable" "coordinate singularity" of the curvature tensor is actually real and is not removable by coordinate transformations!

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I argue, that there is specialty at the horizon. Why do we think that the equation of geodesic deviation gives us the tidal force (the right side)? I argue. Even if this is so, a more refined equation gives a specialty at the horizon (see very solid article of very serious prof. Risto Tammelo [Gen. Rel. Grav. 1997;29:997–1009]). 2) The deviation equation assumes that the time at different distances from the horizon is synchronized (clocks coincide). But we know, what in terrestrial conditions it is not observed.

Do not forget to read my abstract. As have been explained, we never see a body crossing the boundary of the black hole. It will slow down and slow down. But the body soon (in own proper time) crosses the event horizon without a special pain. However, scientists are still feeling some sort of "splinter in the brain". They came up with a wall of fire [1]; they argue that Hawking radiation stabilizes the black hole and it turns into a special "planet" to smash a falling body [2]. And I'm doing my part: the horizon is like a concrete wall, which flattens the body. Do not fall!

Body A has a trajectory $t = 1/(r - 2M)$ and after it is approaching the horizon the observer B: $t = 2/(r - 2M)$. The functions here are schematic, and a detailed calculation is possible [3]. The local speed of non-geodesic motion of B is not close to the light. Therefore Special Relativity effects do not appear in a critical way for his observations. Thus, the distance between A and B is measured by the metric for a fixed coordinate time [4]:

$$\Delta s = \int \frac{dr}{\sqrt{1 - 2M/r}} .$$

As you can see, when A approaches horizon, $\Delta s \to 0$. Hence, a spatial body D flattens. Conventional tidal forces stretch the body. I have an unusual tidal force, it flattens. It may even need another name.

If the A is photon, the B collides with it nevertheless (we argue, that horizon area is so in-homogeneously curved, that Special Relativity assumption of spacetime homogeneity is violated). Thus, the B will collide also with any massive free-falling particle P. Because P has not escaped from slow-moving B (which $v \ll 1$), then it will not be missed by a free-falling object (including photon). On the horizon is one huge collision, thus, indeed, there can be (concrete) firewall. In conclusion, free-falling spatial body D also flattens.

The components of the Riemann curvature tensor have finite values in the orthonormal tetrad (ie, the frame of reference), including the free-falling tetrad. Is known that the Riemann tensor as any tensor consists not only of the components. The most important thing are the basis vectors of this tensor. Here is the tensor of the first rank: $\vec{a} = a_\nu \vec{e}^\nu$, as you can see, in addition to the components a_ν of the tensor there is also the basis vectors $\vec{e}^\nu = \{\vec{e}^0, \vec{e}^1, \vec{e}^2, \vec{e}^3\}$. Scalar product of the curvature tensor constituents can go to infinity on the horizon, just to illustrate: $\vec{a}\,\vec{e}^1 = \infty$. The infinity of Riemann tensor components (in the transition from the curvature coordinates into orthonormal tetrad) goes into infinite basis vectors of the Riemann tensor. So the infinity/singularity is not removed from the whole tensor. In other words, the singularity of the Riemann tensor is incorporated in its basis, if it is not visible in the components.

I. FURTHER DEVELOPMENT

If the observer B is free falling, than the effects of Special Relativity is critical, because $v \to 1$ at horizon. So the observer sees the Lorentz contraction of the space below the ship. Thus, the distance in Schwarzschild coordinates is more, than in the observer system $\Delta s > L$. Wherefore, because $\Delta s \to 0$, the A and B coincide $L = 0$.

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[1] Pankaj S. Joshi, Ramesh Narayan, Black Holes, Firewalls and Chaos from Gravitational Collapse, arXiv:1402.3055.

[2] Laura Mersini-Houghton, Backreaction of Hawking radiation on a gravitationally collapsing star I: Black holes?, Phys. Lett. B **738**, 61-7 (2014) arXiv:1406.1525. See also the research continuation in arXiv:1409.1837.

[3] Dmitri Martila, Bat Catches Fly in Schwarzschild Spacetime, viXra:1412.0138. P.S. The "I have critically examined Ref. 7" is wrong: "I have critically examined Ref.[12]" is correct.

[4] Lightman AP, Press WH, Price RH, Teukolsky SA. Problem Book in Relativity and Gravitation. Princeton, Princeton University Press, 1975.