Moving into Black Hole: is there a wall?

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Abstract

I argue, that there is speciality 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 speciality 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.

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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 $t = 1/(r - 2M)$, body B trajectory $t = 2/(r - 2M)$. The functions here are schematic, and a detailed calculation is possible [3]. And the local speeds of non-geodesic motion are not close to the light. Therefore Special Relativity effects do not appear in a critical way. 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.

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.

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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.