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Description of the black-hole geometry in alternative theories of gravity

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I present the general parametric framework for description of the space-time geometry of a black hole in metric theories of gravity.

We propose an approximate representation for the metric tensor, using rational functions, which depend on coefficients of deviation from the Kerr space-time. The functions are defined through convergent continued fractions.

Superior convergence of the continued fractions allows us to have a good approximation with a relatively small set of the coefficients. The method allows us to construct approximate analytic expressions for the metric functions that can be useful for experimental tests of the strong gravity regime and also for theoretical study of space-times in the gravitational theories, in which the solutions are known only numerically.

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