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Accretion in a hybrid metric-Palatini f(R)-gravity for spherically symmetric black holes

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Nowadays, General Relativity is the generally accepted gravitational theory. However, there are some issues, which cannot be explained within the framework of modern physics, such as dark energy, dark matter, inflation etc. One of the ways to solve these problems is to modify gravity. f(R)-gravity is among the simplest ways to modify gravity. Unfortunately, f(R) - theories without screening mechanisms have some problems with describing observational data. One of the most elegant and effective solutions to these problems is hybrid metric-Palatini f(R)-gravity. This theory successfully describes observational effects in the solar system, double systems with pulsars, cosmological dynamics, etc.

But in order to become generally accepted, such a gravitational theory must explain everything the same as general relativity can explain. The goal of this work was to test the possibility of describing accretion in hybrid f(R)-gravity. For this purpose, accretion onto a spherically symmetric black hole in Thorne-Novikov model in case of hybrid f(R)-gravity was considered. In this work we numerically calculated the energy flux, temperature distribution, emission spectrum and energy conversion efficiency of accretion disks.

Primary author: AVDEEV, Nikita (Sternberg Astronomical Institute (Moscow State University))

Co-author: Dr DYADINA, Polina (Sternberg Astronomical Institute (Moscow State University))

Presenter: AVDEEV, Nikita (Sternberg Astronomical Institute (Moscow State University))

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