

SORTING CATEGORY: A. Gravitation

CATEGORY TYPE: A3. Modified Theories of Gravity (theoretical aspects)

TITLE: EXPERIMENTAL RELATIVITY WITH OBSERVATIONS OF THE ACCRETION DISK CONTINUUM SPECTRUM

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ABSTRACT:

Electromagnetic observations have been used over the past decades to understand the nature of black holes and the material around them. Our ability to learn about fundamental physics relies on our understanding of two key ingredients in the modeling of these electromagnetic observations: the gravity theory that describes the black hole, and the astrophysics that characterizes the accretion disk. In this talk, I will discuss our current ability to constrain and detect deviations from General Relativity using the accretion disk spectrum of stellar-mass black holes in binary systems. I will show that even when a very simple astrophysical model for the accretion disk is assumed to be known, the uncertainties and covariances between the parameters of the model and the parameters that control the deformation from General Relativity make any test of General Relativity very challenging with current observations. I will also discuss the implications of assuming that General Relativity is correct a priori on the estimation of parameters of the astrophysical model when the data is not described by the Einstein's theory, which can lead to a fundamental systematic bias.