

CATEGORY TYPE: C9. Experimental Gravitation

TITLE: A comparison between the gravitational wave and the X-ray spectroscopy approaches

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GRANT: A.C.-A. and N.Y acknowledge financial support through NSF CAREER grant PHY-1250636 and NASA grants NNX16AB98G and 80NSSC17M0041. A.C.-A. also acknowledges funding from Fundacion Universitaria Konrad Lorenz (5INV1).

ABSTRACT:

General Relativity has passed a plethora of tests in the Solar System and with binary pulsars, yet it remains weakly tested in the strong field regime, where the spacetime curvature is large. Electromagnetic observations of the radiation emitted by an accretion disk around a black hole, as well as gravitational wave observations of coalescing binaries, can in principle be used to test Einstein's theory in this regime. In this talk we compare and map these two approaches to each other, so that theory-agnostic (parameterized post-Einsteinian) constraints placed with gravitational waves can be used as priors in electromagnetic tests and viceversa. We find that gravitational wave observations are already placing very strong constraints on parametric (bumpy) deformations of black hole spacetimes that may supersede the constraints achievable with current X-ray observations of the reflection spectrum.