

DYNAMICAL AND SEMICLASSICAL PROPERTIES OF REGULAR BLACK HOLES IN QUASITOPOLOGICAL GRAVITY

Juan Pablo **ARBELAEZ**

Centro de Matemática, Computação e Cognição (CMCC)
Universidade Federal do ABC (UFABC)
Santo André, Brazil
juan.arbelaez@ufabc.edu.br

Abstract

This work investigates the physical properties of higher-dimensional regular black holes arising from the recently proposed infinite tower of higher-curvature corrections to General Relativity. These theories generate singularity-free black-hole solutions while preserving event horizons and a consistent semiclassical description. Using analytical and numerical methods, we study scalar and electromagnetic perturbations and compute the corresponding quasinormal modes, greybody factors, absorption cross sections, and Hawking radiation spectra. We find that higher-curvature corrections systematically reduce both the oscillation frequencies and damping rates of the quasinormal modes relative to their general relativistic counterparts. In addition, the maximum of the effective scattering barrier decreases, shifting the greybody factors toward lower frequencies. Despite the resulting enhancement of transmission in the transition region, the decrease in Hawking temperature dominates the thermal spectrum and substantially reduces the overall emission rates.