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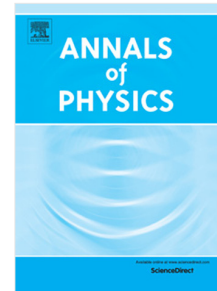
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# Charged Black String Thin-Shell Wormholes in Modified Gravity

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## Abstract

In this paper, we explore the possibility for the existence of thin-shell wormholes for the charged black string in the framework of  $f(R)$  gravity theory. We have carried out our analysis by keeping linear perturbations about static equilibrium solutions where we have surgically pasted the interior spacetime to an exterior vacuum geometry. We have assumed logarithmic as well as exponential form of well-known  $f(R)$  models and investigated their role in the modeling of stable/unstable thin-shell wormholes. As a specific case, we perform our analysis through distributions of mass, charge and equation of state parameter. We found that various static thin-shell wormhole backgrounds are possible for different parametric values of  $f(R)$  models. We also concluded that modified gravity induced by logarithmic and exponential  $f(R)$  models could likely to host wide range of wormholes.

**Keywords:** Black strings;  $f(R)$  gravity; Stability.

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## 1 Introduction

The theoretical existence of wormholes (WH) has fascinated the researchers and public alike while the black holes (BH) are admitted as cosmological reality. The BHs and WHs are both

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