RESEARCH ARTICLE

## Some properties of evolving wormhole geometries within nonlinear electrodynamics

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**Abstract** In this paper, we review some properties for the evolving wormhole solution of Einstein equations coupled to nonlinear electrodynamics. We integrate the geodesic equations in the effective geometry obeyed by photons; we check out the weak field limit and find the traversability conditions. Then we analyze the case when the lagrangian depends on two electromagnetic invariants and it turns out that there is not a more general solution within the assumed geometry.

**Keywords** Nonlinear electrodynamics · Exact solutions · Wormhole

## **1** Introduction

Recently, the interest in wormholes has increased because of the possibility of interstellar travel or future time travel to past world. Since the formulation of Einstein's equations, several features of these solutions were addressed, such as Einstein–Rosen bridges [1]; Wheeler [2] analyzed this kind of solutions and coined the name of wormholes. The most important and popular contribution to these solutions was given by Morris and Thorne [3], they were the first who made a complete

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