RESEARCH ARTICLE

## Quasinormal modes of *D*-dimensional de Sitter spacetime

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**Abstract** We calculate the exact values of the quasinormal frequencies for an electromagnetic field and a gravitational perturbation moving in *D*-dimensional de Sitter spacetime  $(D \ge 4)$ . We also study the quasinormal modes of a real massive scalar field and compare our results with those of other references.

Keywords de Sitter spacetime · Quasinormal modes · Classical fields

## **1** Introduction

Motivated by Brane World scenario in String Theory and by the study of the higher dimensional features of General Relativity, recently there has been considerable interest in understanding the dynamics of classical fields moving in higher dimensional spacetimes (see Refs. [1–31] for some examples).

The main reason to study the quasinormal modes (QNMs) of black holes is its possible astrophysical importance; however, in many physical relevant cases an exact analytical computation of the quasinormal (QN) frequencies is not possible and they are calculated by using numerical methods or suitable approximations (see Refs. [32–34] for reviews). Recently, it was shown that the QNMs are a useful tool in understanding the AdS-CFT and dS-CFT correspondences and some aspects of quantum gravity [35–41]. For these and other reasons the QN frequencies of several fields have been calculated in some higher dimensional spacetimes [16–31].

From a theoretical viewpoint, it is useful to have a list of examples in which we can exactly compute the QN frequencies to achieve a better understanding

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