

Spectroscopy in Einstein-Maxwell-scalar theories

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The Einstein-Maxwell-scalar (EMS) theory provides an ideal framework to observe deviations from general relativity. A specific instance of this theory involves a scalar field that is minimally coupled to gravity and non-minimally coupled to the Maxwell field. In addition to the usual Reissner-Nordstrom solutions this theory also admits BH solutions with scalar hair. Another example is the Einstein-Maxwell-dilaton theory in four dimensions, which arises from the compactification of the Einstein-Maxwell theory in five dimensions. The latter admits magnetized black holes and topological solitons known as topological stars. We investigated the stability of these solutions by studying both spherical and non-spherical perturbations. We computed the quasinormal modes (QNMs) spectrum both in the frequency and time domain, finding significant agreement between the two methods.

Primary author: MELIS, Marco (Istituto Nazionale di Fisica Nucleare)

Co-authors: PANI, Paolo (Sapienza University of Rome & INFN Roma1); CROFT, Robin (Istituto Nazionale di Fisica Nucleare); CORELLI, Fabrizio (Istituto Nazionale di Fisica Nucleare); DIMA, Alexandru (Università Sapienza)

Presenter: MELIS, Marco (Istituto Nazionale di Fisica Nucleare)

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