

报告九题目： Gravito-Electromagnetic coupled perturbations and QNMs of a charged black hole with scalar hair

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报 告 摘 要：

From the quantum point of view, singularity should not exist. Recently, Bah and Heidmann constructed a five-dimensional singularity free topology star/black hole [Phys. Rev. Lett. 126,151101 (2021)]. By integrating the extra dimension, a four-dimensional static spherically symmetric black hole with a magnetic charge and scalar hair can be obtained. In this paper, we study the quasinormal modes (QNMs) of the magnetic field and gravitational field on the background of this four-dimensional charged black hole with scalar hair. The odd parity of the gravitational perturbations couples with the even parity of the magnetic field perturbations. Two coupled secondorder derivative equations are obtained. Using the matrix-valued direct integration method and the matrix-valued continued fraction method, we obtain the fundamental QNM frequencies numerically. The effect of the magnetic charge on the QNMs is studied. The differences of the frequencies of the fundamental QNMs between the charged black hole with scalar hair and the Reissner-Norström black hole are very small for the angular number $l = 2$.