Insight into the thermodynamic phase transition of RN-AdS black holes in massive gravity via Quasinormal modes and unstable circular photon orbits

- We used the quasinormal modes (QNMs) frequencies of a massless scalar perturbation to probe the phase transition of the high dimension charged AdS black hole.
- The signature of the critical behavior of this black hole solution is detected in the isobaric as well as in isothermal process.
- Below the critical isothermal phase transition, we have shown that the spacetime dimension affects the behavior of QNMs.
- QNMs are not appropriate to probe 2^{nd} order phase transition of BHs.
- As an alternative, we have explored the unstable circular orbits of photons around charged AdS black holes in massive gravity as a new bridge to the Van der Waals-like phase structure.

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Based on:
1-Eur. Phys. J. 76 (2016) no 12, 676 arXiv:1606.08524;
2-Astrophys. Space Sci. 76 (2016) no 12, 676 arXiv:1701.00872;
3-arXiv:1902.00557 (2019).

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