

## Area spectra of the rotating BTZ black hole from quasinormal modes

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(Submitted on 28 Jan 2010)

Following Bekenstein's suggestion that the horizon area of a black hole should be quantized, the discrete spectrum of the horizon area has been investigated in various ways. By considering the quasinormal mode of a black hole, we obtain the transition frequency of the black hole, analogous to the case of a hydrogen atom, in the semiclassical limit. According to Bohr's correspondence principle, this transition frequency at large quantum number is equal to classical oscillation frequency. For the corresponding classical system of periodic motion with this oscillation frequency, an action variable is identified and quantized via Bohr-Sommerfeld quantization, from which the quantized spectrum of the horizon area is obtained. This method can be applied for black holes with discrete quasinormal modes. As an example, we apply the method for the both non-rotating and rotating BTZ black holes and obtain that the spectrum of the horizon area is equally spaced and independent of the cosmological constant for both cases.

Subjects: **High Energy Physics - Theory (hep-th)**; General Relativity and Quantum Cosmology (gr-qc)

Cite as: [arXiv:1001.5106v1](#) [hep-th]

### Submission history

From: Soonkeon Nam [[view email](#)]

[v1] Thu, 28 Jan 2010 05:45:14 GMT (11kb)

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