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| Title:                     | Non-Commutative Space-Time and BTZ Black Hole  |
| Authors:                   | <a href="#">Ankur</a>  |
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| Abstract:                  | <p>In the thesis, we have studied BTZ black holes in non-commutative space-time. The aim is to study thermodynamics of BTZ black holes in different types of non-commutative space-time. We have used metrics obtained from two different formalisms, one via Chern-Simons theory and Moyal product approach while the other ones inspired from coherent state formalism. In coherent state formalism, we have used two types of distribution (Gaussian and Lorentzian) to study charged but non-rotating black holes in non-commutative space-time. It should be noted that static and non stationary metrics were noticed via Chern-Simons theory in non- commutative space-time. To study thermodynamics of BTZ black hole in non-commutative space-time we have used quantum tunneling formalism and Hamilton Jacobi method and GUPs are used to add quantum corrections to it. A bound on non commutative parameter <math>\theta</math> in case of Lorentzian distribution in coherent state formalism has been proposed for a particular case of BTZ black hole. To study thermodynamics in Gravity's Rainbow, a new formalism is proposed in which Gravity's Rainbow has been studied in non-commutative space-time and intrinsic temperature has been calculated. To relate thermodynamics quantities of BTZ black hole in non-commutative space-time with thermodynamics of a CFT, Holography principle has been tested and verified.</p> |
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