



Contribution ID: 142

Type: Poster

Topology of thermodynamics in R-charged black holes

Topology of thermodynamics in R-charged black holes

Naba Jyoti Gogoi, Prabwal Jyoti Phukon

Dibrugarh University, Dibrugarh, India, 786004

Abstract

In this presentation, our investigation focuses on the topological aspects of thermodynamics in R-charged black holes across four, five, and seven dimensions. Specifically, the 4D R-charged black hole features four charges, while the 5D and 7D counterparts possess three and two charges, respectively. Within our study, we explore how the charge configuration of these R-charged black holes influences the topological characteristics of their thermodynamics. Within each of these black holes, we systematically examine various charge configurations, calculating the corresponding topological charges associated with critical points. These critical points are subsequently classified as either conventional or novel, guided by the values of their respective topological charges. It's noteworthy that the number and nature of these critical points are contingent upon the charge configuration of the R-charged black holes, regardless of the dimensionality involved. Remarkably, our analysis reveals a consistent total topological charge across all charge configurations in the 4D, 5D, and 7D scenarios, maintaining a constant value of $Q=-1$. This finding strongly suggests that R-charged black holes in these dimensions share the same thermodynamic topological class. In conclusion, our research underscores that variations in charge configurations do not exert any discernible impact on the topological classification of thermodynamics for R-charged black holes in 4D, 5D, and 7D dimensions.

(This talk is based on a recent work that is published in Physical Review D.)

Email

gogoin799@gmail.com

Affiliation

PhD Research Scholar

Author: GOGOI, Naba Jyoti (PhD Research Scholar)

Co-author: Dr PHUKON, Prabwal (Assistant professor)

Presenter: GOGOI, Naba Jyoti (PhD Research Scholar)

Session Classification: Classical & Quantum Gravity

Track Classification: Classical & Quantum Gravity