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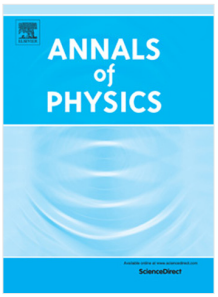

Quantum loop corrections of charged dS black hole

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Quantum loop corrections of charged dS black hole

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Abstract

A charged black hole in de Sitter space considered and logarithmic corrected entropy used to study thermodynamics. Logarithmic corrections of entropy come from thermal fluctuations which play role of quantum loop corrections. In that case we are able to study the effect of quantum loop on the black hole thermodynamics and statistics. As black hole is a gravitational object, so it helps to obtain some information about the quantum gravity. The first and the second laws of thermodynamics investigated for logarithmic corrected case and find that it is only valid for the charged dS black hole. We show that the black hole phase transition disappears in presence of logarithmic correction.

Keywords: Quantum loop, Black Hole, Thermodynamics.

1 Introduction

As we know, important black hole quantities like horizon radius, mass, charge, temperature and so on are related by an equation of the form the first law of thermodynamics [1]. Therefore, the black hole thermodynamics is important and interesting field of research. Among several kind of black hole, study of asymptotically anti-de Sitter (AdS) black holes are interesting from aspects of AdS/CFT [2] or AdS/QCD correspondence [3, 4]. In another hand, there is a correspondence between a gravitational theory in de Sitter space and conformal field theory [5]. In that case thermodynamics study of asymptotically de Sitter (dS) space is interesting and important, for example see Ref. [6]. dS black holes are also interesting from cosmological point of view. Because in addition at the early universe, during inflationary epoch universe was a de Sitter space, and in far future it will turn into a de Sitter space

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