Contribution ID: **46** Type: **Talk/Seminar**

Quantum corrections in rigidly-rotating thermal states on anti-de Sitter space

Rigid rotation has gained a lot of interest in the field of relativistic heavy ion collisions due to the experimentally observed polarization of the Lambda hyperons [1]. This polarization can be explained via various mechanisms (spin-orbit coupling [2], axial chemical potential [3]) using quantum field theory at finite temperature. On Minkowski space, exact expressions can be obtained for massless fermions [4]. All thermal expectation values diverge as the speed of light surface (SOL) is approached. This prompts the analysis of similar states in bounded domains [5], or in bounded space-times, such as the anti-de Sitter (adS) space [6], which exclude the SOL. In this talk, the rigidly-rotating thermal states (RRTS) of fermions at finite chemical potential on the anti-de Sitter space are discussed, highlighting the formation of the SOL when the rotation parameter Ω exceeds the inverse radius of curvature ω. A comparison with classical relativistic kinetic theory results is presented to highlight the role of quantum corrections.

References:
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