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Does thermodynamics rely on Lorentz invariance?

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It is a well-known fact that, in General Relativity, there exists a strong connection between gravity, acceleration and thermality. Indeed, computations of quantum field theory in a curved background show that the vacuum state for a matter field is described as a thermal spectrum both in the presence of a Black Hole (Hawking Radiation) and in an accelerated framework (Unruh effect).

Previous investigations have shown that, if matter is given with a Lorentz Violating dispersion relation, this connection breaks down.

On the other side, Lorentz Violating theories of gravity, such as Horava Gravity, represent good candidates for an UV completion of GR.

Therefore, in this talk I will investigate thermodynamical properties in such a background, showing that it is actually possible to recover them, even if in a different fashion with respect to the GR case.

Topic Field

Gravity

Faculty position

PhD

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