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Emergent thermal space-time in rotating systems

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In this talk, I first summarize how systems at local thermal equilibrium are described by the partition function of the underlying QFT in a fictitious curved space-time constructed with the hydrodynamic fields [1]. I list how this duality has been used to study systems at thermal equilibrium in the presence of acceleration and rotation. In particular, I show how this helps to describe systems with macroscopic spin properties and to resolve the ambiguities related to the definition of a spin tensor [2]. Finally, I discuss how the spin-rotation coupling of a particle differs in a actual rotational space-time and in a rotating medium [3].

[1] M. Hongo, Annals Phys. 383 (2017);

M. Crossley, P. Glorioso and H. Liu, JHEP 09 (2017) 095;

M. Selch, R. A. Abramchuk and M. A. Zubkov, PRD 109 (2024) no.1, 016003

[2] M. Buzzegoli, A. Palermo, [2407.14345]

[3] M. Buzzegoli, D. Kharzeev, PRD 103 (2021) 116005 [2102.01676]

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