



Probing the Unruh effect with an extended system

Daniel Augusto Turolla Vanzella

Universidade de São Paulo, Brasil.

The traditional interpretation of the Unruh effect -- according to which uniformly accelerated observers in the Minkowski vacuum see a thermal bath of Rindler particles - has been recently challenged on the basis that non-local (two-point correlation functions of) observables can be used to distinguish the accelerated thermal bath from an ordinary (inertial) one.

This fact -- which is true and is not in conflict with the Unruh effect -- has been used to argue that the traditional interpretation of the Unruh effect would fail for extended systems.

Here, we consider a simple extended system which is sensitive to the main features of the reasoning above (two spatially separated spins, directly coupled to each other and weakly coupled to quantum fields) and calculate its evolution when it is uniformly accelerated in the Minkowski vacuum. We show that its reduced density matrix evolves to a true Gibbs state with temperature given by the Unruh temperature, which is all one can expect from contact with a legitimate thermal reservoir.