

Unruh meets Larmor: Radiation, acceleration, and the surprising role of zero-energy Rindler modes

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The interplay between acceleration and radiation harbors remarkable and surprising consequences. One of the most striking is that the Larmor radiation emitted by a charge can be seen as a consequence of the Unruh thermal bath. Indeed, this connection between the Unruh effect and classical bremsstrahlung was used recently to propose an experiment to confirm (as directly as possible) the existence of the Unruh thermal bath. This situation may sound puzzling in two ways: first, because the Unruh effect is a strictly quantum effect while Larmor radiation is a classical one, and second, because of the crucial role played by zero-frequency Rindler photons in this context. In this talk, I will present how these two issues can be settled by showing how the quantum evolution leads naturally to all relevant aspects of Larmor radiation and, especially, how the corresponding classical radiation is entirely built from such zero-Rindler-energy modes