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Radiative processes of single and entangled detectors on circular trajectories in (2+1) dimensional Minkowski spacetime

We investigate the radiative processes involving two entangled Unruh-DeWitt detectors that are moving on circular trajectories in (2+1)-dimensional Minkowski spacetime. We assume that the detectors are coupled to a massless, quantum scalar field, and calculate the transition probability rates of the detectors in the Minkowski vacuum as well as in a thermal bath. We also evaluate the transition probability rates of the detectors when they are switched on for a finite time interval with the aid of a Gaussian switching function. We begin by examining the response of a single detector before we go on to consider the case of two entangled detectors. As we shall see, working in (2+1) spacetime dimensions makes the computations of the transition probability rates of the detectors relatively simpler. We find that the cross transition probability rates of the two entangled detectors can be comparable to the auto transition probability rates of the individual detectors. We discuss specific characteristics of the response of the entangled detectors for different values of the parameters involved and highlight the effects of the thermal bath as well as switching on the detector for a finite time interval.

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