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Entanglement of Uniformly Accelerating Schrödinger, Dirac, and Scalar Particles WAI LIM KU, MING CHUNG CHU, Department of Physics and Institute of Theoretical Physics, the Chinese University of Hong Kong — We study how the entanglement of an entangled pair of particles in two different modes is affected when one or both of the pair is uniformly accelerated, while the detector remains in an inertial frame. We find that the entanglement is unchanged if all degrees of freedom are considered. However, particle pairs are produced when a relativistic particle is accelerated, and more bipartite systems emerge. We identify the particle and antiparticle excitations in the asymptotic regions where there is no acceleration, which corresponds to detection by inertial detectors. We calculate the entanglements between particles/antiparticles in the two modes, and we find that the distribution of entanglements into the different bipartite systems varies as the acceleration. In particular, the entanglement of a pair of accelerating fermions is transferred preferentially to the produced antiparticles when the acceleration is large, and the entanglement transfer is complete when the acceleration approaches infinity. However, no such entanglement transfer to the antiparticles is observed for scalar particles.

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