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Bell state generation in the presence of complicated entangling interactions¹ KENJI MISHIMA, JST-CREST, KOICHI YAMASHITA, The University of Tokyo, JST-CREST — We present theoretical investigations on the entanglement generation of bipartite two- and three-level systems interacting with complicated entangling interactions and external electromagnetic fields. The theoretical method employed is based on rotating wave approximation (RWA). By using the partitioning of the complicated entangling interaction matrix, we propose a method of creating the Bell state from the initial separable state in bipartite two-level systems. In addition, by using the bipartite three-level model systems, we show how to create decoherence-free subspace when the Bell state is to be generated. The present work will be useful for realization of entanglement manipulation in the presence of complicated entangling interactions in molecular systems.

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