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Universal Entangler Revisited

We will introduce the concept of universal entangler, which is a gate transforms all product states to entangled states. In practice, a universal entangler is a very powerful device for generating entanglements, and thus provides important physical resources for accomplishing many tasks in quantum computing and quantum information. We will show that except for some degenerate cases, the universal entangler always exists. Furthermore, such "universal entangling power" is a generic property for quantum gates. Then we will generalize our results to multipartite systems.