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Entanglement entropy in interacting field theories

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Entanglement entropy (EE) is a useful quantity to measure quantum correlation between separated systems. There has been accumulating progress in the analysis on it, especially in the case of free theories and CFTs. On the other hand, we have relatively little understanding on EE in general interacting field theories. In this work, we propose a general method for calculating such EE by combining 2PI formalism and orbifold method, the latter of which is some variation of replica method. We show that we can write down the EE in terms of exact propagator, which suggest the method is applicable to theories with large radiative correction in the 2-point function.

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