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Universal behavior of the entanglement entropy in 2D conformal quantum critical points and generalized quantum dimer models BENJAMIN HSU, University of Illinois, Urbana-Champaign, MICHAEL MULLIGAN, Stanford University, EDUARDO FRADKIN, University of Illinois, Urbana-Champaign, EUN-AH KIM, Cornell University — We study the scaling behavior of the entanglement entropy of two dimensional conformal quantum critical systems, *i.e.* systems with scale invariant wave functions. They include two-dimensional generalized quantum dimer models on bipartite lattices and quantum loop models, as well as the quantum Lifshitz model and related gauge theories. We show that, under quite general conditions, the entanglement entropy of a large and simply connected sub-system of an infinite system has a universal contribution which is independent of the size of the region. This universal contribution is computable in terms of the properties of the underlying large-scale conformal structure of the wave function of these quantum critical systems.

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