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Bipartite fidelity in the XXZ spin chain at the combinatorial point

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The bipartite fidelity was introduced in 2011 by Stéphan and Dubail as an entanglement measure in quantum many-body systems. It is expressed in terms of the overlap between the groundstate of the whole system and a tensor product of groundstates for two complementary subsystems. For one-dimensional quantum critical systems, the bipartite fidelity has an interpretation in terms of conformal field theory (CFT), and its asymptotic behavior depends on the conformal data of the underlying CFT.

I will discuss the bipartite fidelity for the XXZ spin chain at $\Delta = -1/2$. The combinatorial structure of the model allows us to derive exact finite-size expressions for the overlaps, and to investigate their asymptotic behavior. In particular, our results agree with the CFT predictions of Stéphan and Dubail. This talk is based on arXiv:2111.15223, in collaboration with Christian Hagendorf.

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