Entanglement transitions in random pure states

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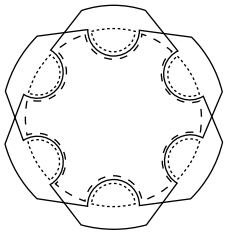
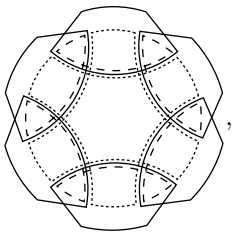
hello

Let us look at the dominant diagrams deep in the NPT limit, $L_A \gg L_B$, when one subsystem (A_1 or A_2) is much larger than the other.

$$\langle \mathrm{Tr}\left(\rho^{T_2}\right)^{n_e} \rangle \approx \begin{cases} L_B^{1-n_e} L_{A_2}^{2-n_e} & L_{A_1} \gg L_{A_2} \\ L_B^{1-n_e} L_{A_1}^{2-n_e} & L_{A_1} \ll L_{A_2} \end{cases} \tag{1}$$



(2)



(3)

To sum up, This in turn implies that

$$\langle \mathcal{E} \rangle \approx \begin{cases} L_B^{1-n_e} L_{A_2}^{2-n_e} & L_{A_1} \gg L_{A_2} \\ L_B^{1-n_e} L_{A_1}^{2-n_e} & L_{A_1} \ll L_{A_2} \end{cases} \tag{4}$$