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Entanglement Generation and Area Law with Long-Range Interactions

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In short-range interacting systems, the speed at which entanglement can be established between two separated points is limited by a constant Lieb-Robinson velocity. This same limit also leads to the so-called area-law bound on entanglement in one-dimensional gapped short-range interacting systems. In this talk, we will show that long-range interactions that decay with distance as a power law allow for faster entanglement generation and state transfer. We will also present sufficient conditions for the area law in gapped systems to hold even in the presence of long-range interactions.