Entanglement Holography

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For general conformal field theories, the entanglement for small perturbations of the vacuum is organized in a novel holographic way. For spherical entangling regions in a constant time slice, perturbations in the entanglement entropy are solutions of a Klein-Gordon equation in an auxiliary de Sitter spacetime. The role of the emergent time-like direction in dS is played by the size of the entangling sphere. For CFTs with extra conserved charges (e.g., higher spin charges), we show that each charge gives rise to a separate dynamical scalar field in dS.