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Quantum Gravity: Entanglement of Black Holes

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The relationship between quantum entanglement and spacetime geometry raises fundamental questions about gravitational interactions and information preservation in black holes. The AdS/CFT correspondence and the ER=EPR conjecture provide frameworks for exploring these connections and investigating the role of quantum correlations in the structure of spacetime.

This contribution presents a doctoral research proposal to investigate how quantum entanglement relates to geometric connectivity in black hole systems. The proposed approach combines the development of a mathematical model of the physical system with analytical calculations and computational simulations to compare configurations under controlled conditions.

Within the broader search for a quantum description of gravity, this work aims to clarify the role of entanglement in understanding gravitational interactions. Black holes provide the setting for examining how quantum correlations relate to spacetime geometry and how changes in entanglement may be associated with changes in geometric connectivity. By studying these connections, the project seeks to better understand the role of entanglement in the gravitational description of spacetime.

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