Contribution ID: **197** Type: **Talk**

Data base search through quantum imaging

Monday, 2 December 2024 14:10 (20 minutes)

Searching algorithms play a crucial role in quantum computing, enabling the efficient identification of specific elements within large datasets. Grover's algorithm, a key example, significantly speeds up searches for unstructured data compared to classical methods. Recent advancements have shown the potential of using optical fields as a computational resource to implement Grover's algorithm, highlighting the advantages of quantum techniques for solving unstructured search problems. We present a novel approach to performing search algorithms through quantum imaging, establishing a link between search algorithms and quantum imaging techniques through complex light. By employing spatially entangled photon states, we demonstrate the equivalence between quantum ghost imaging process and Grover's algorithm. Our results indicate that entangled structured light offers computational advantages, requiring only a single iteration in our optical adaptation - unlike the typical √N iterations due to the higher-dimensional nature of photon wave-functions

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Session Classification: Special

Track Classification: Quantum Computing