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*Generalized Hadamard matrices and quantum measurements*

The columns of a unitary matrix  $M$  may be thought of as a von Neumann measurement in quantum mechanics. When the entries of  $M$  are highly structured, such as in a generalized Hadamard matrix, the measurement may prove particularly useful in quantum computing. I will give three instances of this phenomenon and describe the combinatorics involved in each: mutually unbiased bases, weighted complex 2-designs, and the entanglement-assisted capacity of a graph.