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Michael Vasmer: Fault-tolerant quantum computation with topological subsystem codes

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Quantum error correction seems to be indispensable in the quest to build a useful, i.e., fault-tolerant, quantum computer. Traditional approaches to quantum error correction rely on stabilizer codes such as the surface code. However, there exists a more general family of quantum error-correcting codes known as subsystem codes. Subsystem codes have advantages such as evading restrictions on transversal gates via a technique known as "gauge-switching" and increasing the logical clock speed via a phenomenon known as "single-shot error correction". In this talk I will discuss subsystem codes and their advantages, as exemplified by the recently introduced 3D subsystem toric code.