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Genuinely entangled, stabilised subspaces

The stabilizer formalism has been developed as a convenient way to describe quantum correction codes, however its utility does not end there. In our study we present a new procedure that one can use to identify a genuinely entangled subspace that is stabilised by some stabilizer. We use this new procedure to derive a bound on the dimension of a stabilised, genuinely entangled subspace. Then, to show that this bound can be saturated, we present an example of such a subspace of maximal dimension and through the violation of a Bell inequality we show that this subspace can be self-tested.

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