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## Generation of GHZ states via projected squeezed states

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Emerging quantum technologies rely principally on quantum phenomena such as superposition and entanglement for their unique capabilities. To this end, it is essential to develop well-defined and efficient protocols to produce and further exercise control over states of quantum bits that exhibit desired quantum mechanical traits. From a pure separable multipartite state, a control sequence, which includes rotation, spin squeezing via one-axis twisting, quantum measurement and post-selection, generates a highly entangled multipartite state, which we refer to as a *Projected Squeezed* (*PS*) state. Through an optimization method, we then identify parameters required to maximize the overlap fidelity of the *PS* state with the maximally entangled Greenberger-Horne-Zeilinger (*GHZ*) state. The method leads to an appreciable decrease in the state preparation time of *n*-qubit *GHZ* states when compared to preparation through unitary evolution. The efficiency of the *PS* state protocol is studied in non-ideal experimentally relevant settings by simulating decoherence channels using numerical methods.

## Apply to be considered for a student ; award (Yes / No)?

Yes

## Level for award; (Hons, MSc, PhD, N/A)?

PhD

Primary author: Mr ALEXANDER, Byron (Stellenbosch University)

**Co-authors:** Dr JOHN, Bollinger (National Institute of Standards and Technology (NIST)); Prof. MARK, Tame (Stellenbosch University)

**Presenter:** Mr ALEXANDER, Byron (Stellenbosch University)

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