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How far can we push quantum variational algorithms without error correction? RYAN BABBUSH, Google — Recent work has shown that parameterized short quantum circuits can generate powerful variational ansatze for ground states of classically intractable fermionic models. This talk will present numerical and experimental evidence that quantum variational algorithms are also robust to certain errors which plague the gate model. As the number of qubits in superconducting devices keeps increasing, their dynamics are becoming prohibitively expensive to simulate classically. Accordingly, our observations should inspire hope that quantum computers could provide useful insight into important problems in the near future. This talk will conclude by discussing future research directions which could elucidate the viability of executing quantum variational algorithms on classically intractable problems without error correction.

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