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**Preparing states for quantum chemistry and physics on quantum computers** JARROD MCCLEAN, JONATHAN CARTER, WIBE DE JONG, Computational Research Division, Lawrence Berkeley National Laboratory — Simulation of chemistry and physics problems has emerged as one of the earliest potential applications of quantum computers. The preparation of specific quantum states is often either the objective of algorithms designed to treat these problems or plays a crucial role within them. On pre-threshold quantum devices, this preparation procedure is plagued by the influence of external noise or errors, ultimately limiting the set of states one can reliably prepare. In this talk, we discuss new methods for the preparation of both ground and excited states of quantum systems with techniques to mitigate the influence of noise on pre-threshold devices in these preparations. Example applications in the electronic structure of molecules will be used to demonstrate the performance of the methods.

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