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**Progress toward quantum simulation experiments with a high-performance dysprosium machine** WILLIAM LUNDEN, PIERRE BARRAL, MICHAEL CANTARA, LI DU, ALAN O. JAMISON, WOLFGANG KETTERLE, Massachusetts Institute of Technology — We report on progress toward quantum simulation experiments in a new, high-performance dysprosium experiment. We have implemented a number of novel solutions during the construction of this machine which we anticipate will mitigate certain technical barriers in future experiments: a titanium vacuum chamber and non-magnetic surrounding optomechanics to minimize stray magnetic fields; a combination of near-resonant and far-off-resonant slowing light to optimally load our magneto-optical trap; a networked set of laboratory sensors (e.g., temperature, humidity, laser power) whose readings can be stored and investigated for correlations; and custom analog voltage sources with state-of-the-art stability and noise characteristics.

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